

# Enthusiast'99<sup>®</sup>

OFFICIAL PUBLICATION OF THE INTERNATIONAL 99/4 USERS GROUP

May/June 1984

Vol. 2, Number 3

International  
99/4  
Users Group

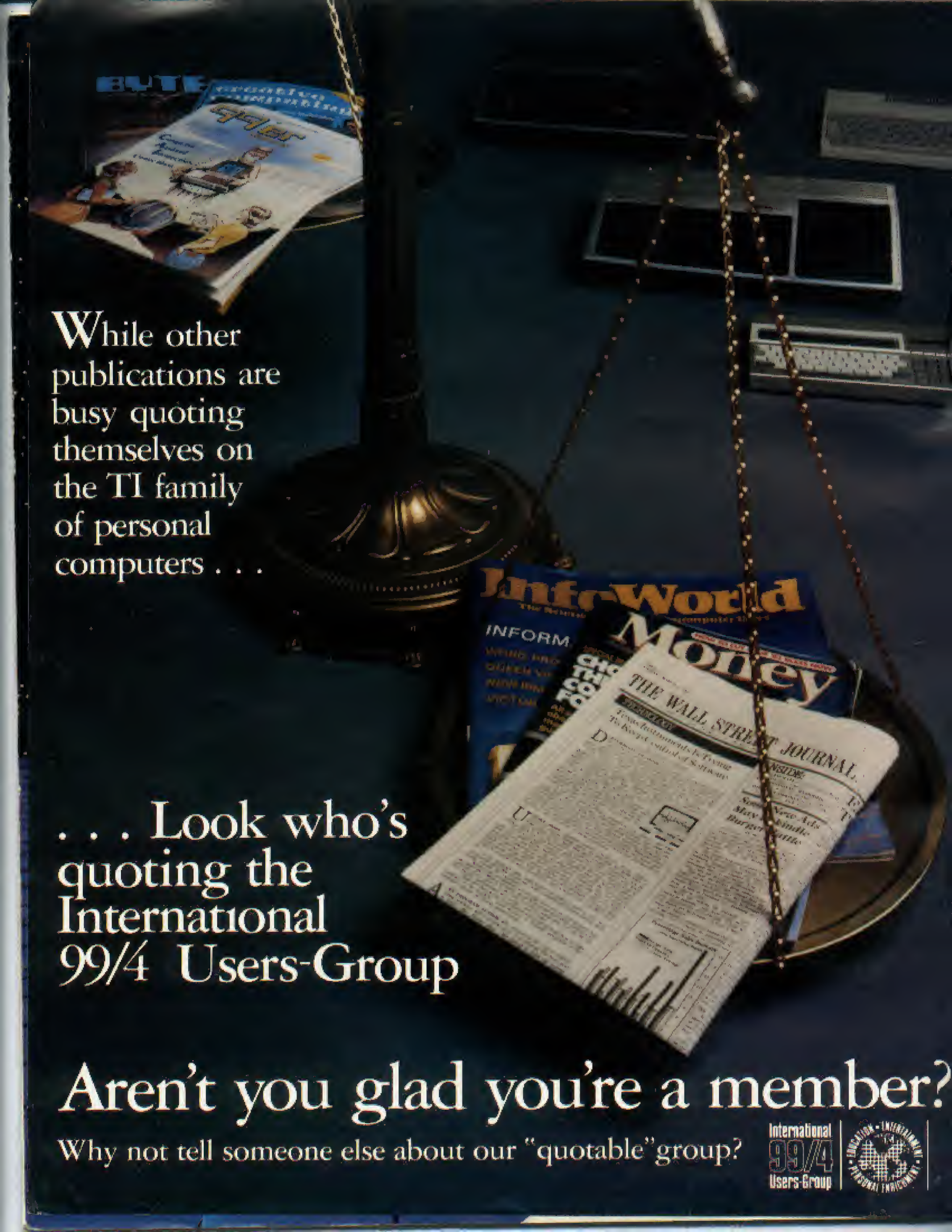


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PHD5221 More Basic Word Building  
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PHD5223 Prefixes & Suffixes  
PHD5224 More Prefixes and Suffixes  
PHD5225 Prefixes & Suffixes in Context  
PHD5226 Selecting the Proper Words  
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PHD5229 Word Meanings

PHD5230 Applying New Words  
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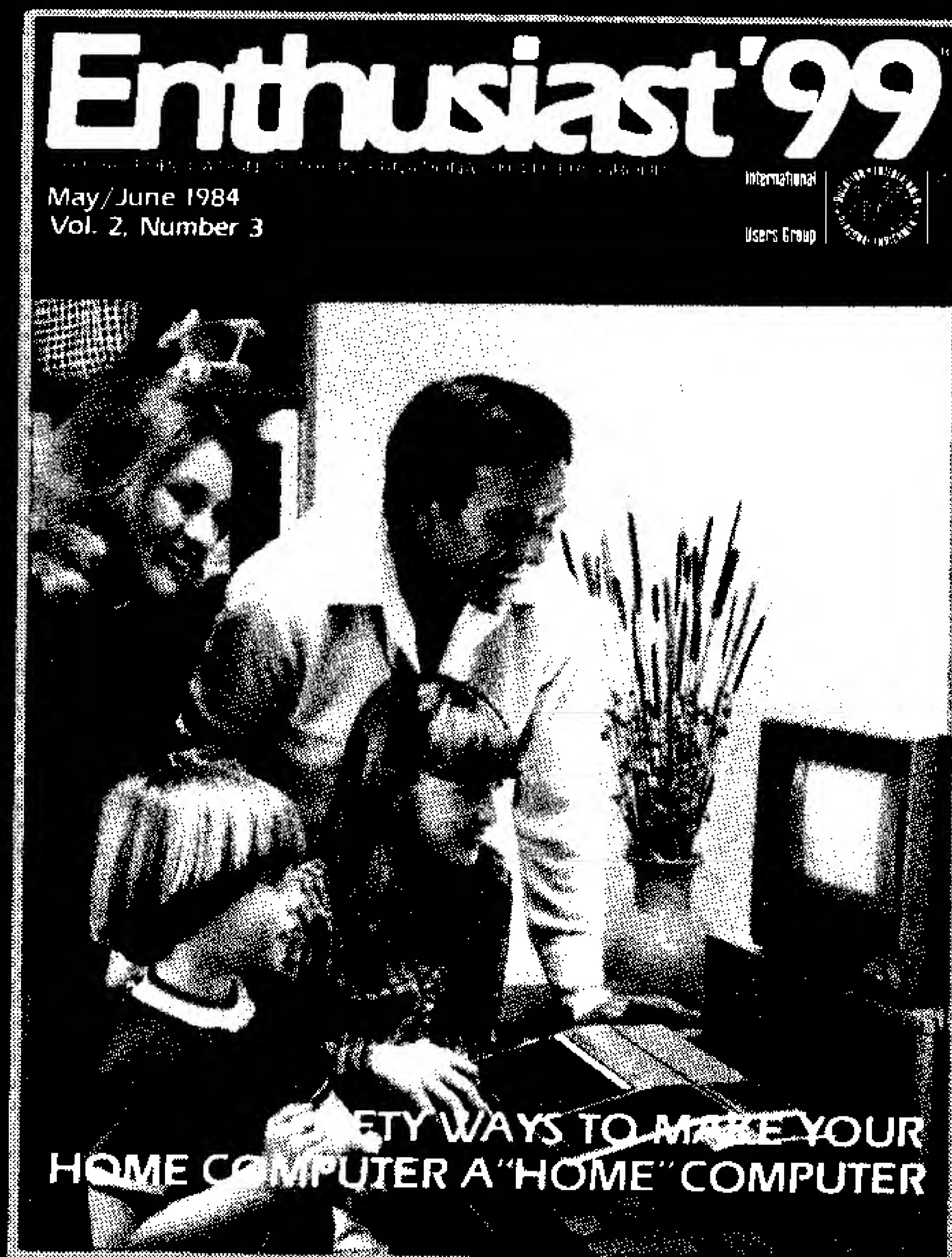
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Vol. 2, Number 3



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<b>NEWS BYTES</b>	<b>3</b>
<b>VIEWS</b>	<b>4</b>
<b>MEMBER SPOTLIGHT</b>	<b>6</b>
<b>SPECIAL FEATURE</b>	
Fifty Ways to Make Your Home Computer a "Home Computer" By Charles La Fara and Dana Nichols	<b>8</b>
<b>A WOMAN'S VIEW</b> By Regena	<b>12</b>
<b>PRODUCT REVIEW</b> By Dana Nichols	<b>14</b>
<b>SOFTWARE</b>	
Three New Titles Added to Master 99 Series	<b>15</b>
Bugout — The Assembly Language Debugger You've Been Waiting For By Terry Heim	<b>17</b>
Programming Hints — Put Your Money Where Your Mouth Is — More on Structured Programming By John Phillips	<b>20</b>
<b>LIBRARY CORNER</b>	
Where's the Catalog? By Tracy Caine	<b>30</b>
<b>HARDWARE</b>	
Multicom's Com-Adapter By Tracy Caine	<b>34</b>
<b>RETAILER'S SHOWCASE</b>	
Computer Corner, Detroit, Michigan	<b>39</b>
<b>CHARLIE'S PAGE</b>	
The Recovery Process By Charles La Fara	<b>40</b>

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# NEWS BYTES

## OUT OF COURT SETTLEMENT REACHED

The International 99/4 Users-Group has agreed to an out-of-court settlement in its suit against The 99/4A Program Exchange, Torrance, CA. The settlement stipulated that The 99/4A Program Exchange would discontinue unlawful use of IUG's copyrighted material, refrain from use of similar trademarks and pay a five-figure sum to the IUG.

Charles La Fara, IUG president, said, "We are pleased at the outcome of this settlement. Wholesale infringement of our Software Exchange Library must be stopped and we are planning several other suits in the near future."

John Cobb, an IUG attorney working on the suit, stated, "Software copyright protection has come to the forefront of our judicial system, and the courts are taking a dim view of software piracy."

## TWO THOUSAND ISSUES LEFT

According to Texas Monthly magazine, there are still 2000 copies of the April 1984 issue available in which the article, "Death of a Computer" appeared. The story, by Joseph Nocera, is one of the most comprehensive articles on the rise and fall of the TI Home Computer.

It details from beginning to end the trials and tribulations which besieged TI's premiere consumer product. Interviews with TI employees unfold the tragedies which led to a \$660 million loss for TI and sheds new insight into many of the mistakes which were made during the marketing of this product.

IUG members interested in obtaining the April issue, available for \$3 each, can enclose a check with their order to Texas Monthly, Back Issue Department, P.O. Box 13366, Austin, TX 78711.

## TI LAUNCHES "DARE TO COMPARE" CAMPAIGN

A major merchandising program that highlights the superior features of the TI Professional Computer was recently announced by Texas Instruments. The "Dare to Compare" campaign is supported by national television and print advertising.

The ad invites buyers to visit participating TI dealers where a special demonstration area is set up to help customers compare the features of the TI Professional computer against the popular IBM PC.

"TI is not just issuing unsubstantiated claims with the 'Dare to Compare' program," said Tom Ellis, vice president for TI's Data Systems Group. "We're challenging people to prove TI's superiority for themselves by making side-by-side comparisons."

## IUG SUFFERS FIRST QUARTER LOSSES

Charles LaFara, IUG president, announced that on first quarter sales of \$1,385,000, the IUG suffered losses amounting to \$184,000. Lack of availability of TI software and hardware products was stated as the main factor for the loss, he said.

Additionally, increased costs in the publication of Enthusiast '99 and loss of TI advertising led to the worst financial quarter in the IUG's three and one-half year history.

## TI NAMES TRITON AS FULFILLMENT HOUSE

Under pressure from the Securities and Exchange Commission to totally exit the Home Computer business, Texas Instruments announced they will no longer sell products for the TI 99/4A Home Computer. An agreement was reached between TI and The Triton Company, in which Triton, a direct-response mail order firm, will dispose of all remaining TI hardware and software products. Although availability may be limited on certain products, Triton has received carte blanche to produce additional products should the market demand it.

Texas Instruments will no longer produce any products for their Home Computer, although selected third party companies are expected to pick up some items in both the hardware and software line.

IUG members unable to find TI products in their local area should contact:

The Triton Company  
P.O. Box 8123  
San Francisco CA 94128  
(800)227-6900  
(In Calif. (800)632-4777)

## OLD SOFTWARE CATALOGS NO LONGER IN USE

IUG members should discard their old Software Exchange Library catalogs in lieu of the new catalog which was mailed May 1. All orders postmarked June 1 or later will be filled according to the new catalog entries.

## SOURCE TELECOMPUTING AND COMSAT PROVIDE NEW DIGEST TO SHIPS-AT-SEA

Source Telecomputing and The Communication Satellite Corporation (COMSAT) have announced a joint service called MARIPRESS, which enables passengers aboard ships-at-sea to receive the latest international news, perhaps even sooner than their neighbors back home.

MARIPRESS will be provided by COMSAT'S World Systems Division/Maritime Services.

The MARIPRESS News Digest, which began May 1, includes daily dispatches of weather, sports, business and general news. Information is compiled by STC's electronic newsroom throughout the day and evening and is transmitted to a COMSAT earth station. From there, operators transmit The MARIPRESS Digest to ships in the Atlantic and Pacific oceans via an Inmarsat Satellite.

MARIPRESS is the first joint effort for Source Telecomputing Corporation and COMSAT. Previously, STC's newsroom has provided regularly updated news packages for ITT's overseas telex service and Cox Cable, for their two-way Indax Cable operation.





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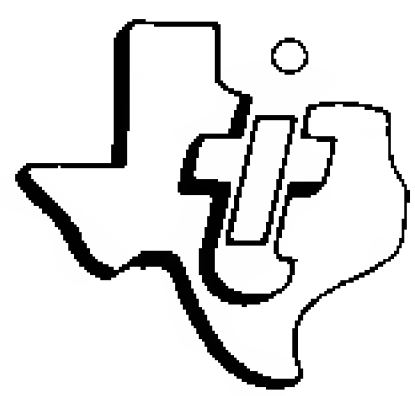
The attitude of the general TI market seems to be that of cautious optimism. More and more third party producers are sticking their feet in and finding out the water's still fine. Most of the questions we're hearing from members now are along the lines of "when and where can we get ----?" instead of "what are we going to do now?"

It's really encouraging to see how the 99/4A has picked itself up, dusted itself off, and emerged from its abandonment by Texas Instruments with hardly a scratch. Everyone is getting really excited about the genuine high quality of third party software, and breathing a sigh of relief when they hear about new hardware and software products that will be introduced.

Members can still obtain available TI hardware and software from Triton, TI's appointed fulfillment house. When those products are gone, however, watch for those third party producers who will introduce new, and possibly, even better versions of products and services for your 99/4A Home Computer.

I see an entirely new beginning for the 99/4A. It's obvious that TI was not able to satisfy the consumer's desires and demands in terms of product; that's how the third party market came into existence. Now, with the IUG's continued commitment to quality software titles in its Software Exchange Library Catalog and continued third party exposure and support through Enthusiast '99, owners of the TI 99/4A have possibly the greatest variety of products from which to choose to extend their Home Computer to the limits of its capacity.





# UNISOURCE ELECTRONICS, INC.

for your Texas Instruments TI 99/4A Home Computer

## WHAT IS UNISOURCE?

- The leading mail order supplier of TI-99/4A equipment and software
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- Has availability of over a thousand different items for the TI-99/4A

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- Offers discount prices to give you more buying power
- Provides a toll free order line for your convenience

(please, all calls other than orders should be directed to the office)

- Accepts MasterCard or Visa charge cards at no additional charge for your shopping convenience
- Normally ships in-stock merchandise to you within 48 hours

## TALK TO YOUR COMPUTER Voice Recognition: MBX EXPANSION SYSTEM



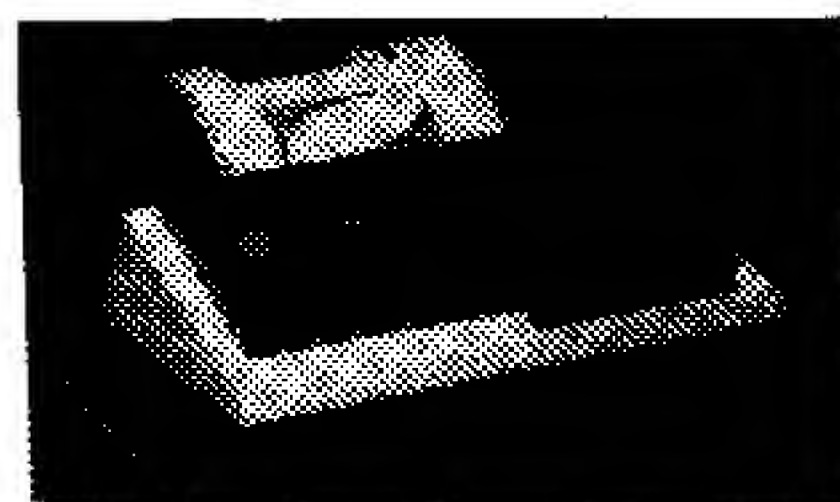
**200 IN STOCK!**

This system is the only one providing voice recognition available for the home computer. Works with 10 software packages developed by Milton Bradley. Includes Control Unit, Joy Stick and Microphone Headset. **\$99.95**

SOFTWARE - \$29.95 ea.

Terry's Turtle Adventure, Honey Hunt, Championship Baseball, Sewermania, Meteor Belt, I'm Hiding, Soundtrack Trolley, Space Bandits, Bigfoot & Superfly.

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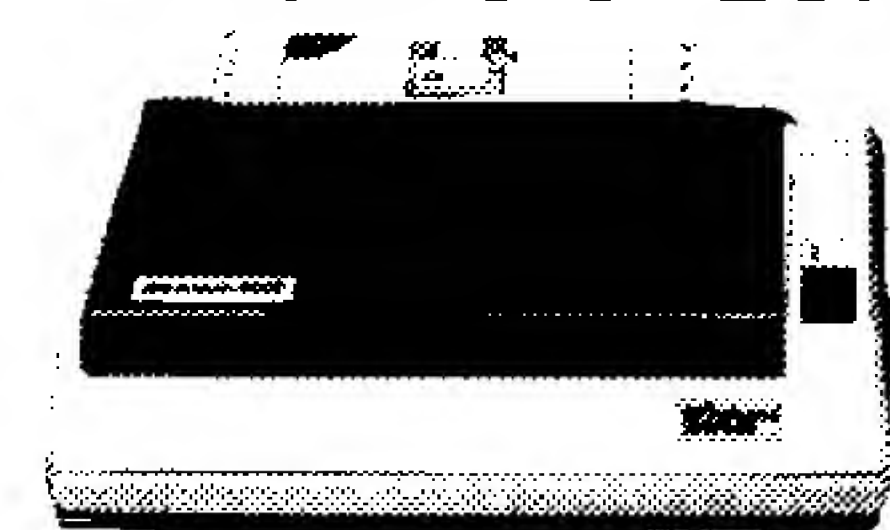
**\$179.95**

**\$179.95**

SEIKOSHA GP-100

your package choice: the Axiom or RS232 card and cable... only **\$179.95**  
Simplicity of operation and proven reliability, together with the Direct-Connect package makes the GP-100 the perfect starter printer. Multiple copies, adjustable tractor, and surprisingly good graphics add to the bargain. Another plus - you can daisy chain other peripherals, i.e. disk drives and memory units. (requires Axiom parallel connector or RS232 card for P.E. Box and parallel cable - your choice \$100.00 with purchase of printer.)

## FEATURES GALORE



GEMINI 10X

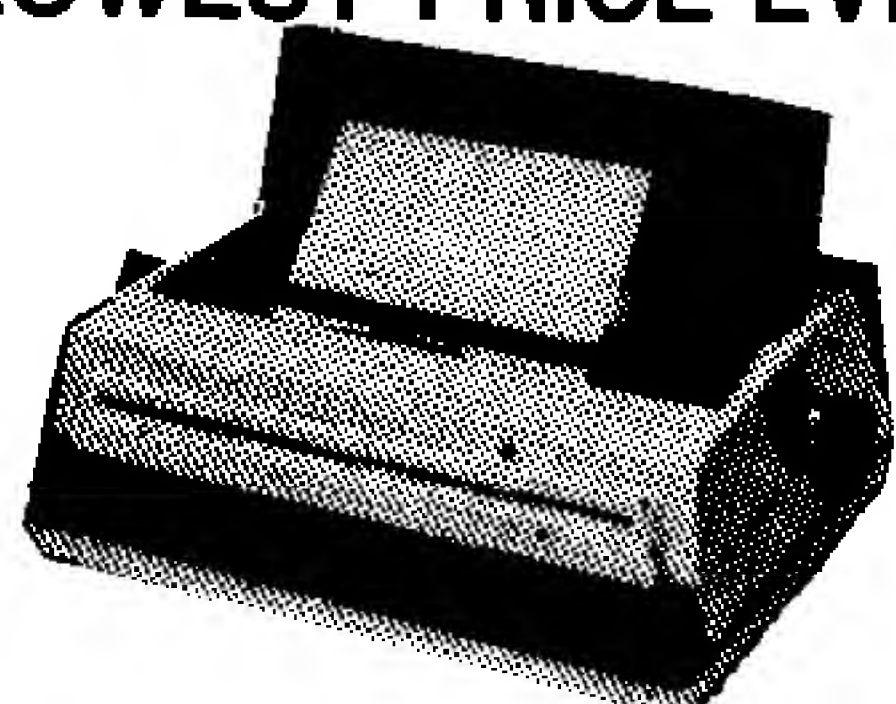
In addition to the features on the most popular printer, it has:

- 120 cps Print Speed, compared with 80 cps
- Friction and Tractor Feed
- Three additional built-in character fonts, plus design your own character fonts... total of nine
- \$4.00 Replacement Ribbon instead of \$12.00 Replacement Ribbon

Package #1 (for TI Peripheral Expansion Box) Gemini 10X printer with RS232 card and cable... only **\$399.95**

Package #2 Gemini 10X printer with Axiom direct connector... only **\$389.95**

## LOWEST PRICE EVER



SMITH CORONA TP-1

only **\$299.95**

While They Last!!

Letter quality Daisy Wheel, 12 cps, Serial hook up package with RS232 card and serial cable... only **\$399.95**  
(LIMITED QUANTITY)

Now your letters, documents, forms, reports, price lists, data sheets and computations can all be printed with the quality you deserve... at a readily affordable price.

## DISK/MODULE STORAGE

Storage for disks or modules and cassettes. From Innovative Concepts

Flip 'N File	Holds 10 Disks	<b>\$ 5.95</b>
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## DISKETTES

Lowest Price Ever

5 1/4" floppy diskettes from Elephant.  
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SS/SD **\$19.95/box of 10**  
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## PRINTER CONNECTION BREAKTHROUGH

ParallFax TI by AXIOM

Hook up your parallel printer without a P.E. Box!! You can even connect to additional peripherals, nothing else required.

only **\$99.95**

- Connects any standard Centronics parallel printer to the TI 99/4A
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## CENTRONICS COMPATIBLE PRINTER CABLE

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NEW!! NEVER BEFORE AVAILABLE!

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THE BAND will provide 12 voice 2 channel stereo output with software control of attack, decay, sustain and release of each channel. A composing system on Disk is included to allow you to program the system as a synthesizer. THE BAND is not usable from BASIC or other programming languages but is meant as a tool to turn the TI 99/4A into a first class music synthesizer for the musician or hobbyist. Required hardware includes disk drive, 32K memory and Editor/Assembler. only **\$299.95**

## PERIPHERALS NOT REQUIRING P.E. BOX

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PARALLEL RS232 by AXIOM

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(available now - parallel port only)

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(expected March availability)  
Plugs directly into console and can be used with other peripherals.

- Daisy chain compatibility with the computer's built-in connector without extra cables
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## GROMBUSTER \$39.95

If you have one of the new TI computers that won't run third party cartridges or modules, we have the solution. NEW!! The GROMBUSTER from Navarone Industries.

Unfortunately, some of the new TI 99/4A consoles will not play some of the new third party cartridges from AtariSoft, Rombox and others. (You can tell if your computer is one of these because the title screen will say "1983 Texas Instruments V2.2.")

The GROMBUSTER plugs into the I/O port and overrides the internal operating system which allows you to use any cartridge manufactured for the TI.

## CARTRIDGE PROGRAMMER

Put your own programs on cartridges.

Cartridge Programmer System	<b>\$299.95</b>
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(allow 4-6 weeks for delivery)

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Extends the game port by providing 3 additional cartridge slots which will hold 3 of your favorite command modules. Reduces wear on Cartridge Connector, prevents overheating of cartridges & has built-in Reset button.

**\$39.95**

## JOYSTICK ADAPTER

Now you can use almost any joystick with your TI. Makes any Atari-style joystick compatible with the TI. Includes ports to plug in two joysticks. **ONLY \$12.95**

## PROSTICK II

A crisp, precise, professional video game-computer controller. Convenient "left/right" single function firing buttons. Unique switchable 4 way/8 way gateplate. Solid steel, short throw control shaft with arcade style ball. Durable leaf-switch mechanism. Easy-grip, hi-impact molded plastic housing. Extra long 6' cord with "strain relief" ends. Full five-year limited warranty. Complete with TI adapter. **ONLY \$28.95**

## 3RD PARTY HARDWARE!!!

COMPLETE P.E. SYSTEM by CorComp

ITEM	PRICE
RS232 Card	<b>\$ 89.95</b>
32K Memory	<b>\$119.95</b>
Disk Controller	<b>\$ CALL</b>
Mini P.E. Box	<b>\$ CALL</b>

## WE HAVE TI HARDWARE!!!

As of publication date Unisource has in stock: P.E. Boxes; Memory Expansion; Disk Controller Cards; Disk Drives; Color Monitors; Speech Synthesizers; Phone Modems; Program Recorders; Joysticks and much more. Prices and availability fluctuate. Please call for current status.

COMING SOON!!

## The TI 99/4A UNISOURCE Encyclopedia/Catalog

You will find this catalog represents the most complete collection of software, peripherals and accessories available today for your TI 99/4A Home Computer. It includes all previously manufactured (by TI) software and peripherals and hundreds of new & exciting software packages from both TI and third-party developers. There's also a collection of peripherals, accessories and supplies for your 99/4A.

Our first three editions of the Encyclopedia/Catalog were extremely popular and we are now completing our 4th revision. It will be available to you for **ONLY \$3.00**, refundable with your first order. And, you'll automatically get future updates at no extra cost. For our current customers who already own our catalog, a new edition will be sent to you free.

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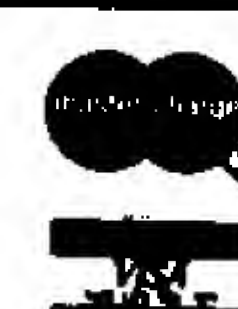
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# MEMBER SPOTLIGHT

## HUBERT MARTIN

In February of 1984, the members of the Michigan-based Great Lakes 99'ers Users Group saw the election of a new president for their club. The new president, Hubert Martin, is featured as this month's Member Spotlight.

Known as "Bounty Bob," (after Tiger-vision's Miner 2049'er video game) Hubert is employed by the Federal Aviation Administration (FAA) as a journeyman technician at Detroit's Metro Airport and at the Detroit City Airport.

Born in Ypsilanti, MI, Martin's interest in electronics began at an early age. After graduating from suburban Detroit's Belleville high school, he was employed by Chelsea-Hayes. He then enlisted in the Army, where he received his education. Entering their Avionics program, he progressed swiftly at Fort Gordon's Electronics school studying basic electronics, UHF/VHF, and radar identification as well as ground navigation and air traffic control.



Seven years and numerous computer and Assembly language courses later, Martin was discharged from the Army and returned to the Detroit area. Ironically, his very first computer experiences

were on TI's own original 9900 microprocessor (a military purchase), in which he built a CPU board to connect it to an output device that looked much like a TI calculator for data entry.

Hubert enjoys family life with wife Sandra, (his junior high school sweetheart) and sons Christopher, 10, and Eric, 7. Sandra is involved in many volunteer services, including the Families for Children program, in which she helps find financial sponsors for children in underdeveloped countries such as India, Somalia and Bangladesh. She utilizes their TI 99/4A for mailing lists and record keeping for over 2000 children to keep sponsors posted on their "adopted" child's progress. The Martin family owns two full systems; an older, daisy-chain style peripheral unit and a more contemporary peripheral expansion box version complete with three disk drives.

In addition to his duties as president of the 75 members-plus Great Lakes 99'ers Users Group, Martin is also a licensed solo-single engine pilot. His on-call, 24 hours per day schedule with the FAA, however, leaves him little time to fly. His duties call for modification, repair, inspection and occasional maintenance on all equipment in airport towers. His work involves all communication gear, color weather radar scopes, the GEO FAX satellite receiver (which generates the color weather pictures you see on your local nightly news), all wind equipment, closed circuit TV systems and instrument landing mechanisms.

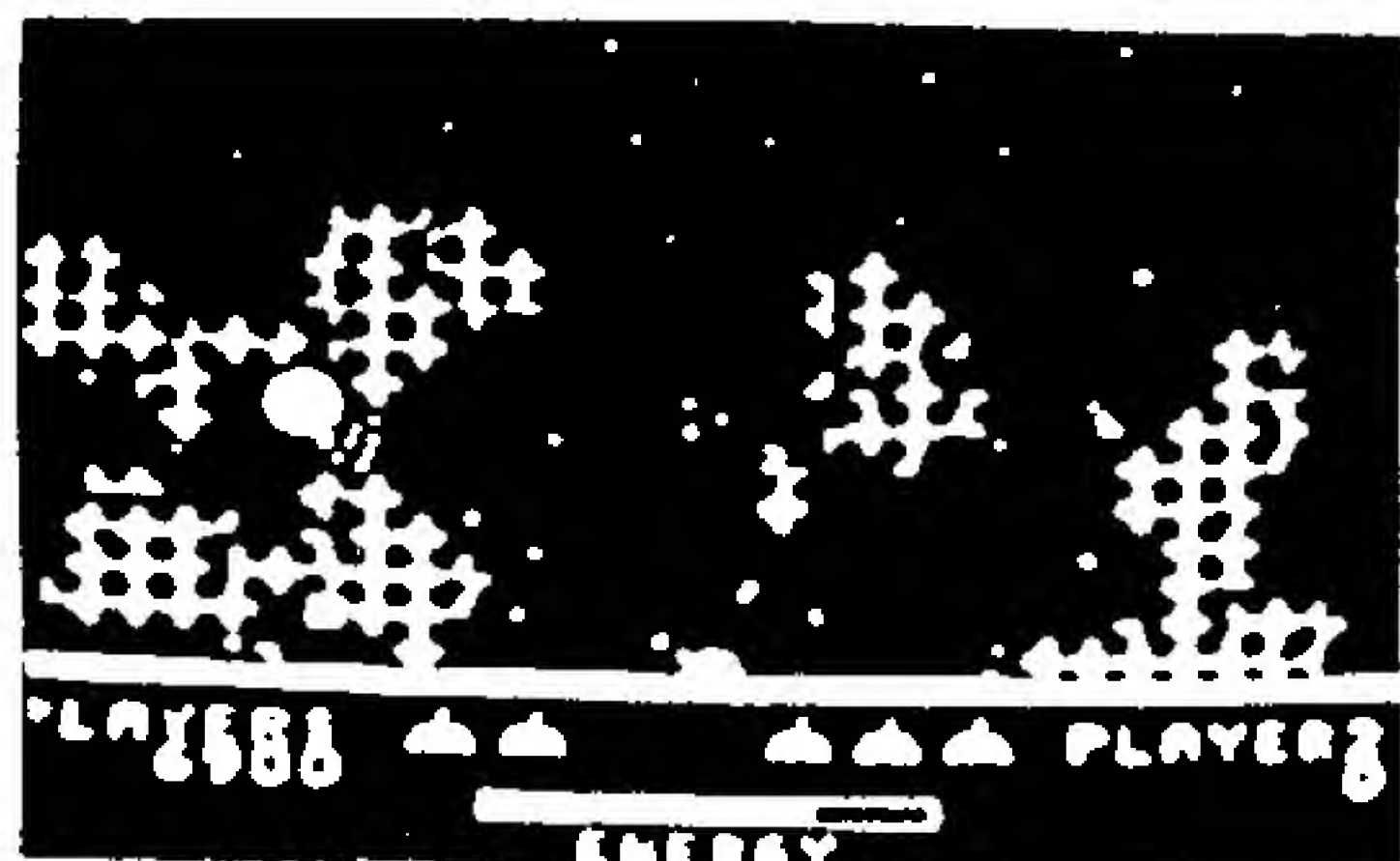
What spare time Martin has, he spends as a computer consultant for small local businesses, and writes Assembly language programs. He is currently working on a new data base program he hopes will rival TI's Personal Record Keeping, and plans to utilize all of the TI's 48K of memory for larger files and faster sorts.

One might think at this point that Hubert would have little time left for anything else, but in fact, he is also studying to attain a Bachelor of Science degree in Computer Science. His studies have included Assembly language for CPU's such as the 8085, 8086, 8080, 6502, 6809, Z-80, and of course, the 9900 series processors.

Hubert is like many loyal owners of the TI 99/4A Home Computer. He has utilized his system in his personal as well as business lifestyle, and has no plans to stop using his 99/4A. In fact, he expressed great optimism about third party producers and their introductions of new TI-compatible peripherals and software. He said, "We TI owners will not be left out in the cold!"

## A Space Adventure . . . STAR FORT

- \* 100% Assembly Language.
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# An Important Bulletin for Home Computer Users

*This is the only programming system you'll ever need  
for your home computer.*

If you own a small home computer, the story we're about to tell you could be of great help. It's about a revolutionary new software programming system that will let you and your entire family take full advantage of that machine you bought. But first things first, so here's a list of the home computers this product was specifically designed for: Atari 400, 600, 800, XL Series; Commodore Pet, VIC 20 and 64; IBM PCjr; TRS-80 color computer; TI-99/4A and the Timex Sinclair 1000, 2048 and 2068. If you own one of these computers, it would be well worth your time to read further.

## THE PROBLEM WITH HOME COMPUTERS

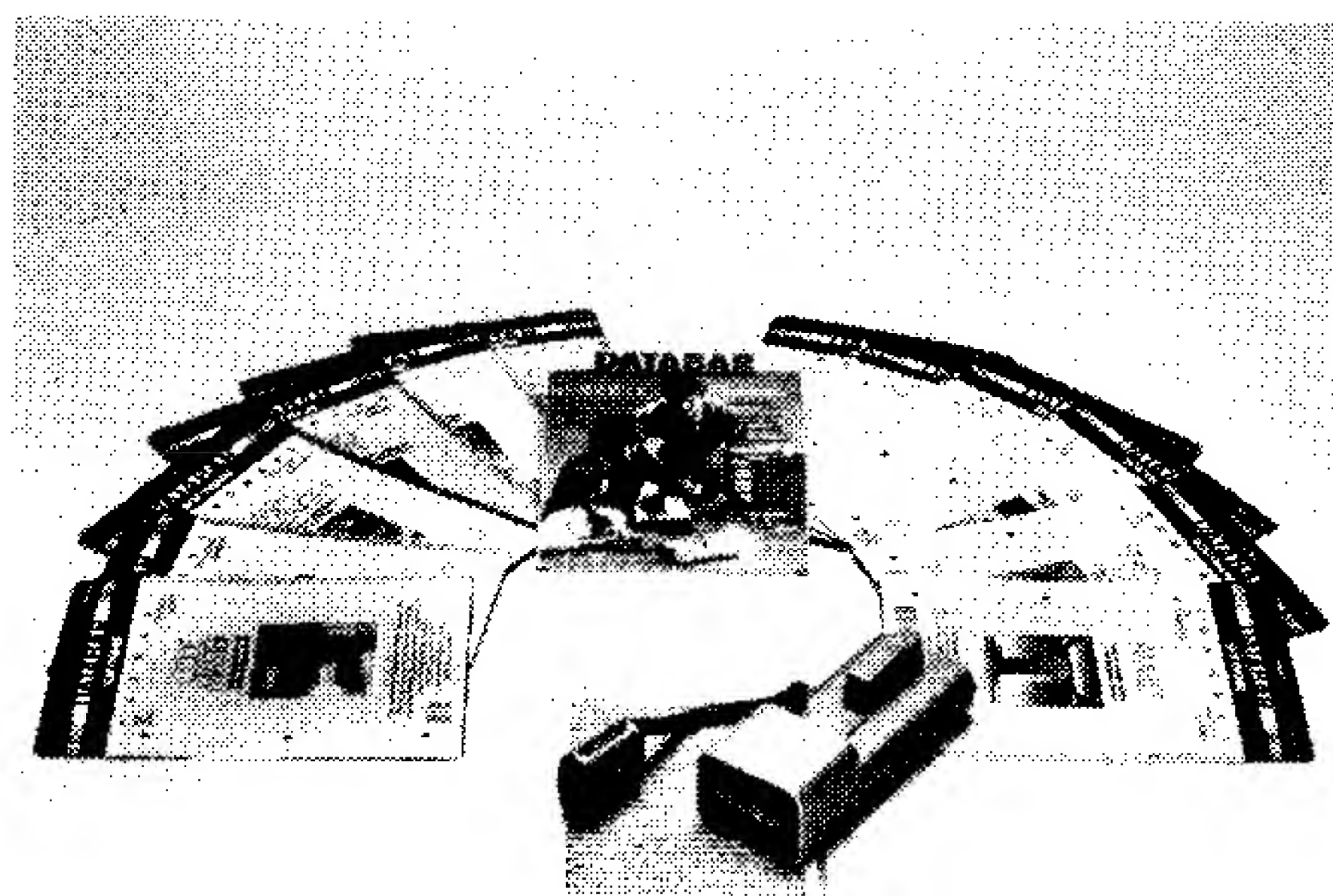
As you probably know, the problem with these small computers is how to get good software into them. Keyboard entry is too time consuming. Diskettes do the job well, but the loaders are expensive and so are the diskettes. Cassette loading is less expensive, but the cassettes themselves still aren't cheap and sometimes a program has to be read again and again before it actually is entered. Furthermore, few of these software manufacturers guarantee their product to run at all.

So unfortunately, a lot of these potentially useful computers are relegated to just game-playing or, even worse, they find their way onto a closet shelf somewhere behind the bowling ball or last year's magazines.

## THE SOLUTION IS DATABAR SOFTWARE

Now, thanks to the engineers at Databar Corporation, you can bring your computer back to life. They have developed OSCAR — which stands for an Optical Scanning Reader. What it does is read a bar code program in much the same manner as your local supermarket reads the bar code information on your grocery products. OSCAR plugs directly into your computer, and can read even complex programs extremely fast. In fact, in a recent time test it took a graduate computer programmer 1 hour, 9 minutes and 43 seconds to successfully type-in a program. To enter that same program, it took an eight-year-old child with no computer experience only eight minutes and 17 seconds.

With OSCAR, programming is also inexpensive. The bar code programs read by OSCAR are printed on paper, making the programs inherently a lot less costly to produce than cassette tapes or diskettes. And because the programs cost less to produce, they can be sold to you for significantly less.



But, just because they cost less doesn't mean they aren't of the highest quality. In fact, they are so good and reliable, we are almost alone among software manufacturers to guarantee our product to run as advertised.

Databar Corporation has already developed an extensive library of programs ranging in subject matter from non-violent games to science, health, home management, writing skills and more. These programs are readily available at your local computer store and they retail for under \$10 (about 1/3 what a diskette costs).

## THE DATABAR CLUB

But amazingly, you can get great software programs for an unbelievable \$1.25 each — if you choose to join the Databar Club. Every charter member gets 12 monthly issues of the Databar magazine each featuring at least eight great programs. In addition, this

family oriented magazine also features articles on related subjects and computer use in general. The subjects covered by the software include: games, home management, classroom learning, health, law, science, writing skills, and computer programming. What's more, Databar Club members get a three-ring binder for their software programs as well as eligibility for exciting contests.

But whether you join the Databar Club or purchase individual program packages from your favorite retailer — OSCAR can dramatically change the amount and quality of the use you get out of your computer. And let's face it: in the not so distant future much of an individual's competence will be tied up in how well he or she interfaces with a computer.

This trial offer includes OSCAR plus the premier issue of Databar magazine. OSCAR is backed by a full 1-year warranty and if you aren't 100% satisfied with OSCAR, then you can return the unit within 30 days for a full refund.

To order, credit card holders call toll free and ask for OSCAR, or send a check plus \$1.50 for shipping and handling for each unit ordered.

OSCAR with the premier issue of Databar magazine can be yours for only \$79.95. And the premier edition of Databar magazine provides all details necessary for joining the Databar Club. So send for your OSCAR today — and take full advantage of your computer tomorrow.

☐ **Option 1 (\$79.95)**†\*†† OSCAR — a professional quality optical reader for easy programming of your home computer in minutes, plus a trial copy of DATABAR Magazine.

☐ **Option 2 (\$120.00)** Charter Member DATABAR Club 1-year subscription to DATABAR Magazine with 8 programs every issue.

☐ **Option 3 (\$35.00 Q1)** Same as Option 2 but payable \$35 per quarter.

☐ **Option 4 (\$240.00)**† Charter Member DATABAR Club 2-year subscription to DATABAR Magazine — with a FREE OSCAR, the industry's finest barcode programmer.

☐ **Option 5 (\$10.50)** Trial copy of DATABAR Magazine — chock-full of barcode programs.

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# SPECIAL FEATURE

## FIFTY WAYS TO MAKE YOUR HOME COMPUTER A "HOME" COMPUTER

By Charles La Fara  
and Dana Nichols

Integrating a computer into your family takes time and patience. Some family members get stuck using only one or two applications, while other members feel slighted if the computer has little to offer them.

The 99/4A has much to offer. Its capabilities are so vast, literally thousands of ideas have transpired into useful applications for use on the 99/4A by everyone from the small child to the housewife to the travelling executive.

The most important word we'd like to focus on is HOME. The enthusiasm for the computer must be spread throughout the home in order for the family to become a more solid and unified body. All must be able to benefit from the computer both individually and as a group. The personal computer can bring families together in a way no other machine can; understanding its capacities can make your home a happier and more harmonious one.

We've looked at hundreds of software titles both in our Software Exchange Library catalog and by third party software producers. Programs we felt would be used to the greatest advantage in the home are in the areas of Education, Telecomputing, Home or Small Business, Record Keeping, Miscellaneous Home Uses, and Entertainment. We have listed below some of what we think are the best ways to really make your Home Computer a "Home" Computer.

### TELECOMPUTING

Telecomputing. The word itself has a futuristic ring to it, and that's exactly what it is: futuristic.

Today, consumers are able to contact thousands of databases utilizing their home computer. Most experts in the computer field today feel that telecomputing is the way in which most Home Computers will be utilized during the next decade. Once reserved for multimillion dollar Fortune 500 companies for remote communications, telecomputing costs have now fallen into a lower price range, enabling almost anyone who owns a Home Computer to afford some type of telecommunicating service.

Today, services in telecomputing offer a vast array of information in such diverse fields as consumer information,

medicine, travel, congressional records, electronic mail and many others too numerous to mention. Telecomputing with your TI Home Computer does require some additional equipment beyond the 99/4A console; you will need a Terminal Emulator II cartridge, a stand alone RS232 or PEB with an RS232 card installed and a telephone modem, either direct-connect or acoustic coupler style.

In order to give you an idea of telecomputing services offered to the consumer, we have listed some of the more popular consumer databases.

Although this is not an endorsement of any specific product or service, we have used all of these services extensively and feel that one of the following may be suited to your needs.

Source Telecomputing  
1616 Anderson Road  
McLean, VA 22102  
(703) 734-7500

Operated by Source Telecomputing, a subsidiary of Reader's Digest Association, the Source provides extensive on-line services to owners of personal computers. Source services fall into several categories, including information services, shop-at-home services, employment, financial, computer advice, travel, entertainment, education, electronic mail, on-line Chat capabilities and teleconferencing bulletin boards.

Additionally, Source offers a special service, Texnet, to owners of the 99/4 and 99/4A Home Computers. Texnet is specifically designed with items of interest for TI Home Computer owners, including software uploading and downloading capabilities. There is no additional charge to access the Texnet service.

CompuServe Information Services  
P.O. Box 20212  
Columbus, OH 43220  
(800) 848-8990

One of the big three information services in the country, CompuServe offers an active forum for information exchange between on-line users. Many databases are located within CompuServe's main-frame computer and include such areas of interest as AP world news, banking services, a handicapped users database,

human sexuality, the official airline guide, Washington Post business news and many others.

CompuServe is probably the easiest to use of the three major telecomputing services and is the most economical. Non-prime rates are \$6 per hour.

Dow Jones/News Retrieval Services  
P.O. Box 300  
Princeton, NJ 08540  
(800) 257-5114

Dow Jones/News Retrieval Service is a comprehensive collection of business, financial and general news databases offered by the publishers of the Wall Street Journal. One category, Dow Jones-/News, contains information on over 80 news categories. Also, news extracts are provided from the pages of the Wall Street Journal and Barron's. In addition to tracking stocks and bonds from all major exchanges, Dow Jones/News Retrieval offers additional diverse databases, including current stock quotes, movie reviews, sports report, national weather report, electronic mail and an encyclopedia.

Although Dow Jones/News Retrieval costs a bit more, its services are well worth the charge, from \$.20-.90 cents per minute.

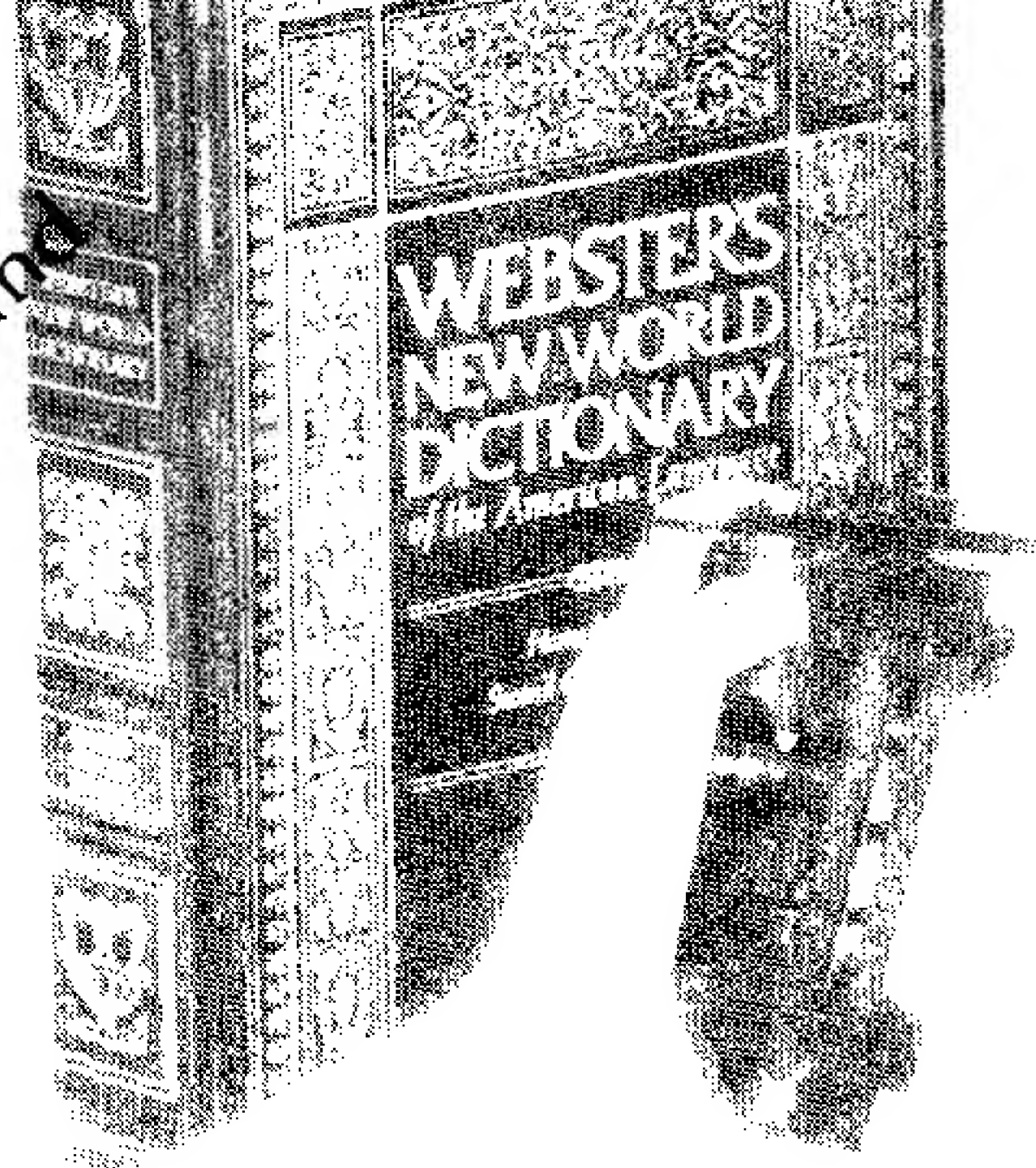
MCI Mail  
2000 M Street N.W.  
Washington, DC 20036  
(202) 293-4255

If you need to send a message quickly, MCI is the way to do it. MCI offers several services to deliver correspondence electronically and conventionally. Services include an **Instant letter** that can be read at the addressee's convenience and is delivered electronically to their computer. The **MCI letter** is usually delivered in one or two days via U.S. Mail. The **Overnight letter** is hand-delivered by noon the following day, and the **Four-Hour letter** is hand-delivered to the addressee in most major cities within four hours.

Although use of the MCI mail service is considerably more expensive than U.S. postal rates, there are many times that both businesses and consumers would enjoy such a service.



**SPECIAL OFFER**  
from the International 99/4 Users-Group  
**PRINTMATE 99** with serial interface cable installed and  
single sheet feeder included  
**\$425.00**  
available immediately



# PrintMate<sup>TM</sup> 99

## THE MOST ADVANCED PRINTER IN ITS CLASS

Today's microcomputer and small business applications are more demanding and complex than ever before, requiring a new breed of printer that can call on capabilities designed to enhance your expression on paper. The PrintMate<sup>TM</sup> 99 is designed with the features to solve your print needs while increasing your computer's throughput. In fact, this printer mates so well with your applications that you'll agree that it should be called a "PrintMate<sup>TM</sup>."

**HIGH SYSTEM THRUPUT** — PrintMate<sup>TM</sup> 99 speeds through each task at 100 characters per second. All printing, interface and paper handling functions are under direct control of PrintMate<sup>TM</sup> 99's microprocessor array. A quick cancel feature provides throughput of up to 150 lines per minute on short lines and the unprinted line slew rate is 600 lines per minute.

**EXPANDABLE PRINT BUFFER** — PrintMate<sup>TM</sup> 99 has a standard 1K buffer memory and is optionally expandable to 2K. In either configuration, PrintMate<sup>TM</sup> 99 will print while simultaneously accepting data from your computer, minimizing your micro's waiting time.

**STANDARD POPULAR INTERFACES** — PrintMate<sup>TM</sup> 99 is plug compatible with most popular microcomputers. Each PrintMate<sup>TM</sup> 99 is equipped for both parallel (Centronics) and serial (RS232C) interface. Other special interfaces are optionally available.

**CORRESPONDENCE QUALITY** — PrintMate<sup>TM</sup> 99 offers near letter quality printing with its 11x9 "serif-style" dot matrix correspondence font. The 7x9 dot matrix allows high speed printing

at either 10, 12 or 17 characters per inch enabling up to 136 columns to be printed on standard letter width paper. Double wide characters are software selectable and can be intermixed on a line for message highlighting. Crisp printing is assured with a long life cartridge ribbon which can be changed in seconds.

**PAPER AND FORMS VERSATILITY** — Printmate<sup>TM</sup> 99 offers exceptional versatility in handling the paper, forms or special media that best suit your applications. Both friction and tractor feed are yours at the flick of a lever. Paper may be from 1 to 9.5 inches in width and multiple copy forms may be as thick as .012 inch without printhead adjustment. Paper and forms can be fed from the front, bottom or rear of PrintMate<sup>TM</sup> 99 to suit the convenience of your workstation.

**SINGLE SHEET INSERTION** — PrintMate<sup>TM</sup> 99's single sheet feeder option lets you insert single sheets of paper from the front of PrintMate<sup>TM</sup> 99 more easily than you load a typewriter. With the single sheet feeder and correspondence font, PrintMate<sup>TM</sup> 99 makes letter writing and printing on cut forms such as invoices simpler than ever.

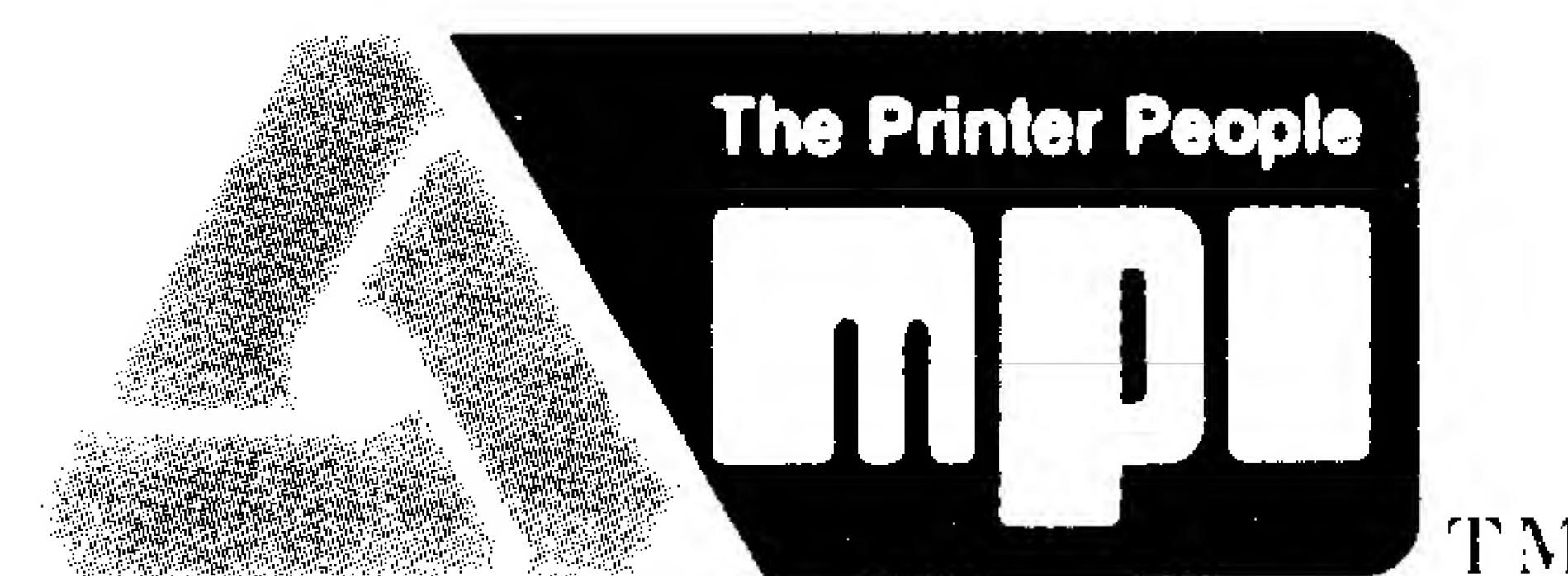
**TRACTOR FEED** — The adjustable tractors give precise control when using fan-fold paper, pre-printed forms and continuous labels. PrintMate<sup>TM</sup> 99's straight paper path performs trouble free printing on self-adhesive labels.

**FRICTION FEED** — PrintMate<sup>TM</sup> 99's friction feed allows the use of paper and other media that is not punched for tractor feeding. Roll paper may be easily used with the PrintMate<sup>TM</sup> 99.

**GRAPHICS** — High resolution, dot addressable graphics capability is included as a standard feature for applications using plotting, printing of screen graphics, special fonts and characters such as logos. The standard graphics capabilities of the PrintMate<sup>TM</sup> 99 allow the printing of 6120 individually addressable dots per square inch offering excellent resolution of graphics and special characters. Horizontal dot spacing is easily set to one of four dot densities.

**SPECIALIZED GRAPHICS PACKAGES** — PrintMate<sup>TM</sup> AP-PAK<sup>TM</sup> applications packages are designed to enable most popular microcomputers to excel in using PrintMate<sup>TM</sup> 99's special graphics and character capabilities. With PrintMate<sup>TM</sup> 99 and an AP-PAK<sup>TM</sup> you can create and edit your own special characters or utilize any one of several fonts. Graphs and bar charts are easily defined and printed using friendly AP-PAK<sup>TM</sup> software.

**SOFTWARE AND HARDWARE CONTROL** — Most PrintMate<sup>TM</sup> 99 functions may be controlled either by printer switch settings or by simple commands direct from your microcomputer. This enables you to print a variety of typesizes and sizes, graphs and special characters continuously under full program control. The PrintMate<sup>TM</sup> 99 is the responsive performer that perfectly mates with your microsystem or personal computer.



**International  
99/4 User's—Group**  
P.O. Box 67  
Bethany, Oklahoma 73008  
Phone 1-405-948-1023



For listings of additional consumer and business databases, you may wish to write Tymnet, 20665 Valley Green Drive, Cupertino, CA 95014. Tymnet is a data communications network which offers database communications to over 200 corporate and consumer subscribers.

Many local computer clubs and hobbyists have developed computer bulletin board systems which are accessible utilizing your Home Computer. Many of these systems are special interest-oriented in such areas as amateur radio, commodity trading, aviation, music, genealogy and other areas of consumer interest. Some are computer-specific, i.e. Radio Shack or Apple, and others are language specific, i.e. Assembly language, CP/M, or MS-DOS. For those of you who already have the equipment necessary for telecomputing, you can access a free database with a comprehensive list of free access systems nationwide. This service is provided by Novation, one of the world's largest manufacturers of telecomputing modems. To access this system using your modem, call (213) 881-6880. This is a 300 baud service and can be accessed 24 hours a day.

When shopping for telecomputing equipment, one of your most important pieces of hardware is the modem. Modem prices range from less than \$100 to the higher-end auto-dial/auto-answer type, which may exceed \$500 in price. Unless there is a specific need for the higher-end modem, any of the five TI Home Computer compatible modems will work very well. (see graph below)

## EDUCATION

Having a tough time keeping the kids entertained during school breaks? We have numerous programs in the Software Exchange Library that will not only enter-

tain them, but will also keep their minds alert during the summer hiatus.

Youngsters, however, aren't the only ones who can benefit from our Education section of the library. Teens and adults as well will benefit from programs such as Capitols and Tutorial Typing. Following are merely a few of the worthwhile programs in the Users-Group Software Exchange Library.

### PRESCHOOL - THIRD GRADE

#### 4384 — Speak Spell Flash

Consisting of five separate programs, this is one of the best educational tools in the library. The programs require the Speech Synthesizer and Terminal Emulator II. Each program contains 75-100 words which, one by one, flash on the screen. The computer will say the word and your child must correctly type in the word. The programs progress in difficulty from #1, two and three letter words, to #5, six and seven letter words. Refer to your catalog for ordering instructions to receive this valuable program set.

#### 4469 — The ABC Show

Geared toward the little ones, this program is a wonderful "listen and learn" tutorial. Hi-res graphics, color and sound will keep your child enthralled and he'll be reciting his ABCs in no time! The program requires Extended BASIC, Memory Expansion, Speech Synthesizer and is available on disk only.

#### 4457 — Math Concentration

A two-player game, this math drill incorporates the game of concentration to match up elementary math equations which have the same total. Correct answers prompt the theme from "The Sting" to play, and the same player's turn continues. Directions are very explanatory; your child and his friends will find hours of fun with this console BASIC program, available only for the 99/4A.

### FOURTH - EIGHTH GRADES

#### 4440 — Super Fly

Good color and graphics make this addition and subtraction drill seem like more of a game. Your child is presented with four problems at one time to solve, and he must look closely to see if he should add or subtract. If he answers all four correctly, the small fly turns into SUPER FLY and a victory melody is played. Extended BASIC is required to run this excellent learning tool.

#### 4335 — Capitols

A BASIC program that is simple in design but extremely effective. Your child is asked the capitol of a state, and shown four cities in that state from which he must choose the capitol. This is an excellent drill and practice program.

### TEENAGERS - ADULTS

#### 4484 — Tutorial Typing

Another set of programs sure to transform you into an expert typist! Good graphics display a keyboard for you to view instead of looking at your fingers. Three programs, a tutorial lecture, drill and practice session, and recap and test, making typing a complete learning experience. The program requires Extended BASIC, Memory Expansion, Speech Synthesizer and is available on disk only.

#### 4474 — Adrift in Algebra

Don't let your child suffer through Beginning Algebra this fall. Give him a head start this summer with Adrift in Algebra. A disabled spaceship provides your teenager with a goal to achieve; correct answers enable him to launch the ship. Too many incorrect answers will see the ship drift into space. This super program requires only console BASIC.

#### 4420 — U.S. Facts

An excellent history quiz, this one- or two-player game drills you or the student in your choice of Presidents, States, and Capitols. Ten points are awarded upon correctly answering the question the first time, with seven and three points awarded for second and third tries. This is a really good BASIC program to test your knowledge.

#### 4424 — Vocabulary Test

This simple program is loaded with useful information to test your knowledge. Different segments deal with definitions, synonyms, and antonyms. Parents should practice with this one beforehand. Don't let your children see you lose at this one!

#### 4383 — States Quiz

A complete course in mastering the names of all the states, capitols, largest cities and popular names of states. This program has been revised and improved, and could take days just to run through the program inventory! It requires Extended BASIC and is menu driven. Master this one and you'll become a U.S. facts WHIZ!!

## MODEM MANUFACTURERS

Manufacturer	Make	Price	Power Supply	Features
<b>Anchor Automation, Inc.</b> 6913 Valjean Avenue Van Nuys, CA 92626	Signalman Mark I	\$99.95	AC Adapter	Universal Type
	Volksmodem	\$69.95	Battery	Audio carrier-detect tone
<b>Compro Electronics</b> 3185-A Airway Costa Mesa, CA 92626	Teledata TD-200	\$79.95	Phone lines	No power supply needed
<b>Human Engineered Software</b> 150 North Hill Drive Brisbane, CA 94005	HESModem I	\$69.95	I/O port powered	Uses telephone base
<b>Radio Shack</b> One Tandy Center Fort Worth, TX 76102	Radio Shack Modem IB	\$99.95	AC Adapter	Color Computer interface



## HOME OR SMALL BUSINESS

The IUG has developed a series of programs designed just for you. The Master 99 Series is a collection of programs written for use with small or home businesses. Each has been thoroughly tested, well documented, and is supplied in an unprotected format for user customization. Any one or more of these programs will benefit your home or small business tremendously, and can be ordered through the IUG. Check your current pricelist or Software Exchange Library catalog for required peripherals.

### M9/120-M9/130 — Accounts Receivable

Fully featured for easy record keeping, M9/120 holds 500 records or transactions on a single file and uses a single sided disk drive. M9/130 holds 2000 records and is for use with a dual-sided drive. The program and the files are held on one disk, thereby eliminating the need to constantly change disks while running programs. The program maintains a current status of accounts, and allows report printouts or individual screen copy.

### M9/140 — Statistics Package

This program is so self-explanatory, it needs no documentation! It consists of seven programs in the statistics field, and provides printed reports of data.

### M9/150 — Bookkeeping System

One of our most popular programs, we've heard nothing but good news about this fully integrated bookkeeping system! Need we say more?

### M9/160 — Point of Sale System

Keep your business in top order with this excellent program. M9/160 keeps track of daily sales and inventory changes. It updates records, provides printouts, and is a tremendous aid in keeping your home or small business running smoothly.

### M9/170 — Retail Accounting System

Also known as La Boutique, this program continually competes with M9/150, Bookkeeping System, for popularity. This complete accounting system allows you to create and maintain all necessary records and files to keep your business up to date.

### M9/180 — Infocenter Record Management

Another of our most requested programs, M9/180 is designed primarily for owners of service businesses with clients, such as doctors and dentists. Any business dealing with a clientele can benefit from this program, which maintains records about clients, updates billing and payment records and schedules, and keeps track of appointments.

### M9/190 — Food Management

Have a small deli or donut shop? Then this program is for you! It maintains all records on food costs and budgeting, with records maintained on a yearly schedule to keep a clear evaluation of costs.

### M9/200 — Departmental Budgeting

This program creates a complete budget system for a department, or it can be used for a small business. Reports are printed out by summary, and final reports

of files are by vendor. In addition, this excellent program allows you to review other departments.

### M9/210 — Tax Depreciation Package

Enable yourself to face that April 15 deadline breathing a little more easily. The program, which requires no documentation, establishes full files for tax depreciation records and maintains yearly updates with a printout of reports on status at any time. Tax tables in this program are adjustable from year to year to help keep your home or small business running smoothly.

### M9/220 — Production Cost Allocation

If you own a manufacturing business involved in the production of a product, this program is a must! It enables you to enter all costs contributing to the makeup of a product, including labor, and project costs. Super program!

### Library Program

#### 5475 — Employee Pay Chart

This simple program makes payroll a snap. Simply enter the withholding percentages at the beginning, and upon entering employee information for that pay period, the program displays net pay for each employee so quickly you'll be able to devote even more time to your growing business.

### Library Program

#### 7065 — Personal Directory

A tape-only program, this program

develops an address and phone number directory for your use. In addition, it alphabetizes and sorts data for you. Never get caught without that address or phone number that just might see your home or small business shoot to success!

(continued on page 32)

## COUNT~SIL

### The Uncomplicated Electronic Spreadsheet

- Powerful, accurate, efficient ...
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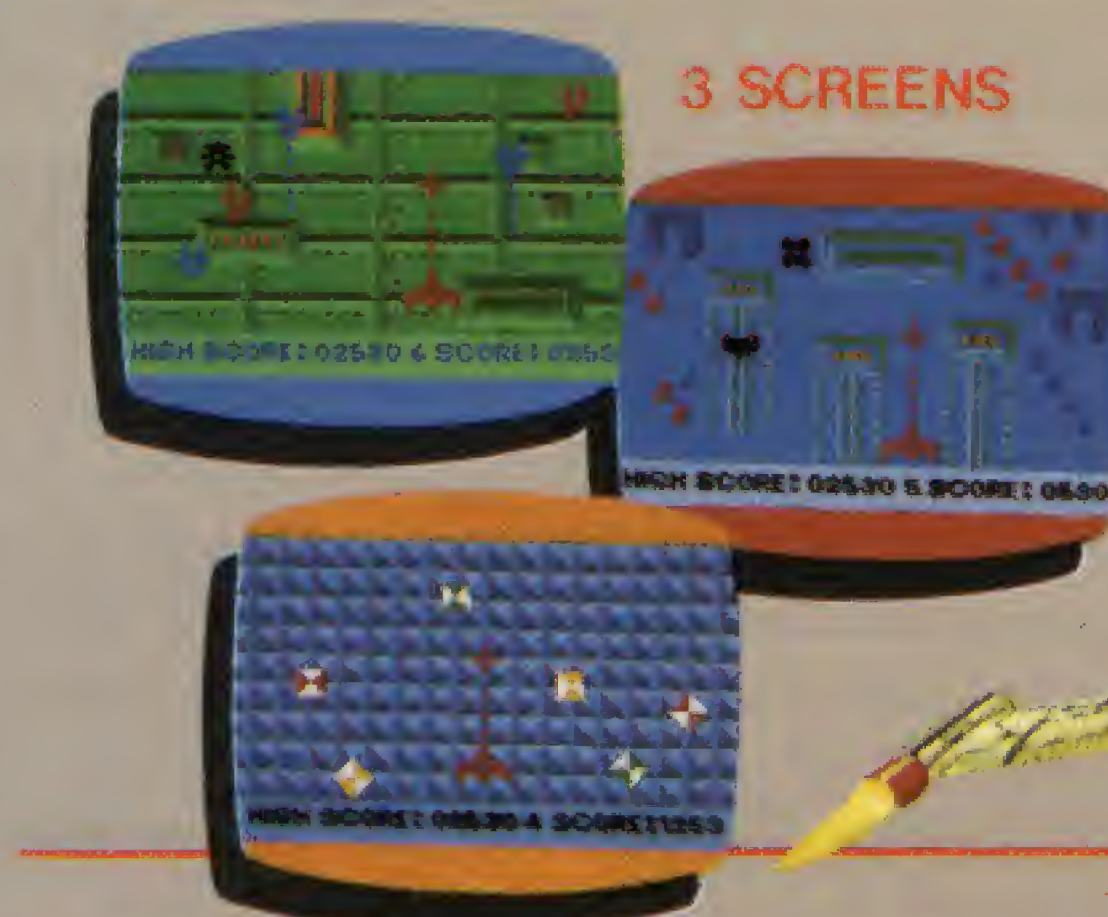
TI Console	U.S.	\$29.95
	Cdn.	\$39.95
TI Extended (32 K RAM Expansion Required)	U.S.	\$49.95
	Cdn.	\$59.95
Extended Basic Command Module Required		
Commodore 64	U.S.	\$29.95
	Cdn.	\$39.95
VIC 20 (16K RAM Expander Required)	U.S.	\$24.95
	Cdn.	\$29.95

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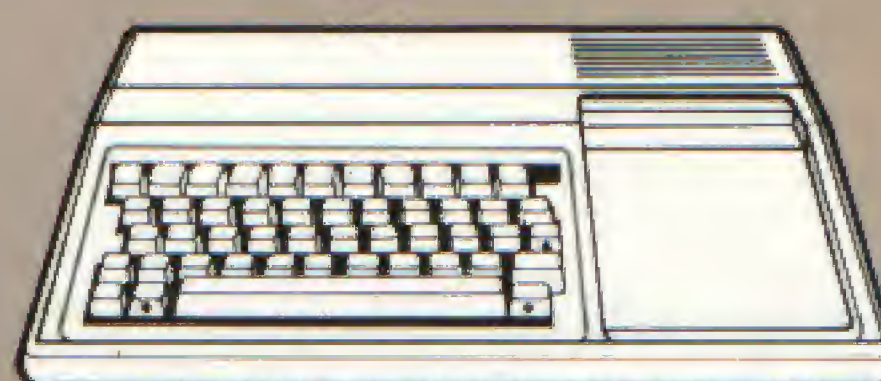


Help

Bounty Bob mine the radioactive mine, section by section. You must clear all 8 sections!

## TI 99/4A EXCITING GAMES!

New games are available for your TI 99/4A home computer. Phone orders are accepted. Charge to VISA or MASTERCARD \$34.95 each.



TI 99/4A is a trademark of Texas Instruments, Inc.

**TIGERVISION® TIGER ELECTRONICS, INC.**

909 Orchard, Mundelein, IL 60060, 312-949-8666



# A WOMAN'S VIEW

## COMPUTERS IN SCHOOLS

By Regena

P.O. Box 1502

Cedar City, Utah 84720

How are computers really being used in schools? Many schools now have computers. In many cases parent-teacher associations and individual parents have been instrumental in purchasing computers for the schools. If schools cannot afford computers, many teachers take their personal computers to class. But now that we have computers in the schools, how are they being used?

One of the big problems still facing the schools is that they don't have enough computers. I know quite a few schools that have perhaps five computers — but five hundred students. One school's solution was to put the computers with their monitors or televisions on traveling carts. Each class in the school got to have the computers for one week, then they were rotated to a different class. Other schools keep the computers in one room and send individual students to the computer room. Often parent volunteers are the staff of the computer room.

My children's elementary school decided it would be more effective to have computers in each room rather than one central computer room. With the large class sizes, just moving a class from one room to another and back is a major disruption. Each classroom has at least one TI-99/4A. The fifth grades also have two TRS-80 Model I computers, and the fourth grades have one TRS-80 Model I. Most of the rooms have more than one computer. Most of the TI modules are

kept in the media center and teachers can check them out. The children are allowed to use the computers before school, during recess, during the lunch period, and after school, as well as during class hours. No matter when I visit the school I notice that the computers are in use.

Many districts are adamant about purchasing one brand of computer for all their schools. One school following the policy ended up with seven computers for the beginning programming class — and 30 students! These elementary schools are proving that it causes no problem to have several different brands of computers. They are able to adapt to the various computers very easily, and those that are interested in programming can use the main BASIC commands on any of the computers. More computers simply means more students can have hands-on time!

Another problem with using computers in the schools is the lack of software. I've seen several cases where the school purchased the computers but had no budget left over to do anything with the computers. I suppose that's okay if the computers were bought for a specific class designed to teach programming. However, programming isn't the only use for computers in schools. Other subject areas can use computers if they have applicable software.

I know a couple of schools that check computers out to parents during the

summer when school is not in session. The parents then contribute any programs they write that could be used in the school. Many libraries now are purchasing low-cost computers that can be checked out. Southern Utah State College Library has a computer room with several computers set up (Apples and TIs) for patrons to use. They also have computers for check-out.

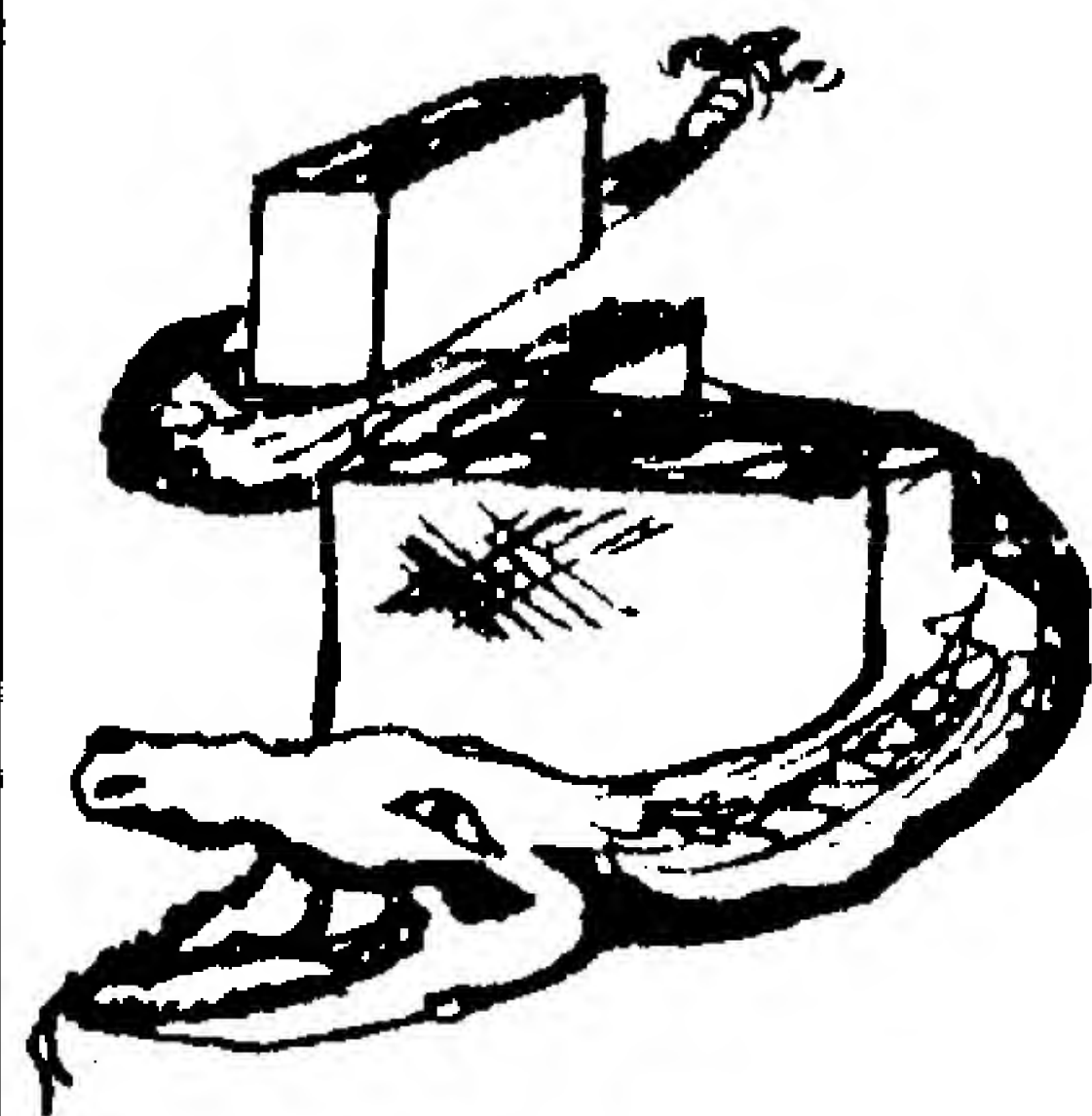
Of course, a good source of software is Users Groups. One glance at our IUG Software Catalog shows several pages of programs that would be appropriate for school use.

Another source of software is the students themselves. The music department at Cedar Middle School in Utah recently purchased two TI computers. A visiting musical group presented a benefit concert to raise the money for the computers. The school is using the TI Music Maker command module and various cassette-based programs from several sources. Some of the most useful programs, however, are programs that have been written by one of the band students, Phil Wright. He is able to customize his programs to fit the needs of the band classes. Other students have been learning to program music on the computer (and adding their own graphics).

Now, what are some actual activities you can do with computers in the school? There are several categories of activities — activities involving the whole class learning specifically about computers, activities in which the computer is used as a teacher's aide, and individualized instruction.

Some activities about computers can be done even if you don't have a computer. For example, divide the class into two teams. Step one is to have the teams think up various procedures and write them down step by step. You can use LOGO commands such as FORWARD 10 or RIGHT 90, or you can use non-computer ideas such as doing a long-division problem, or drawing a picture on the blackboard, or looking a word up in the dictionary. Don't let the other team know what the results of the procedure are. Now take turns. The first team reads the instructions of one of the procedures

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from the second team. Members of the first team do exactly what the instructions say. The second team may watch but not say anything. After the set of instructions is completed, the class can judge if the first team followed the instructions properly (and did all the members end up with the same result?) and if the procedure was written properly. For the second round the second team does a procedure written by the first team.

Now you can relate this activity to computers by indicating that a computer follows a set of instructions (called a program) exactly and only in the order it is told. The computer can also repeat the procedure as many times as you want to run the program, and the result will be the same each time.

Another idea in a class where there are many students and few computers is to give each student a cardboard copy of a keyboard. Some keyboard layouts are sold commercially, or you can make your own. The students can go ahead and learn what various keys do and where they are located without having to actually be at the computer.

I'm going to briefly mention a few activities where the computer is used as an aide. For mathematics courses, the students can quickly check their homework. The TI can add, subtract, multiply, and divide and all the main arithmetic calculations, plus the built-in numeric functions

and DEF (defining your own function) can be used to correct math problems for the upper grades. Students can also "what if" with the computer. The students can calculate a given condition, then change a few parameters and practically instantly see the new result — without having to spend a lot of time on the tedious calculations.

Reading is one of the basic skills that is probably the most important concept taught in elementary schools. A teacher can introduce a literary concept to the whole class, and then divide the class into smaller reading groups. One group can work on activity sheets related to the concept. Another group can do individual reading. The teacher can assist another group with oral reading. And another group can work at the computers with reading software. I really like the Scott, Foresman reading courseware, and it can easily be adapted to either the classroom or the home. Each module has three concepts, and each concept has a "Study It" section which teaches the skill, then a "Try It Out" section which offers practice for the skill in an activity. Each module is self-contained, but a teacher's guide is included which offers more helps for use in the classroom. The teacher's guide contains some reproducible worksheets that one reading group could work on while others are at the computer. There

are also individual readers available which are on the same reading level as the module. If you happen to use the Scott, Foresman basal readers in your class, there are correlation charts to help you even further.

Computer-aided individualized instruction is another area where computers are used in schools. Quite often the software available is the drill and practice type. The randomness feature of the computer makes the drill different each time for the student. The graphics and music of the TI can make the drills more fun. Of course the computer gives the student instant feedback for optimum learning. There are also starting to be more simulation-type programs on various subjects, such as history, economics, and zoology, to mention a few.

I've got to bring this column to a close, but I would like to hear from some more of you teachers who are using computers in your classes. How are you *really* using the computers? What are some of the specific activities? What are some of the problems — and your innovative solutions? How are the students reacting to the computers?

Computers in education is still relatively new. We need to discover ways to really use the computers efficiently in the classrooms. I'll be happy to let you share ideas in this column.

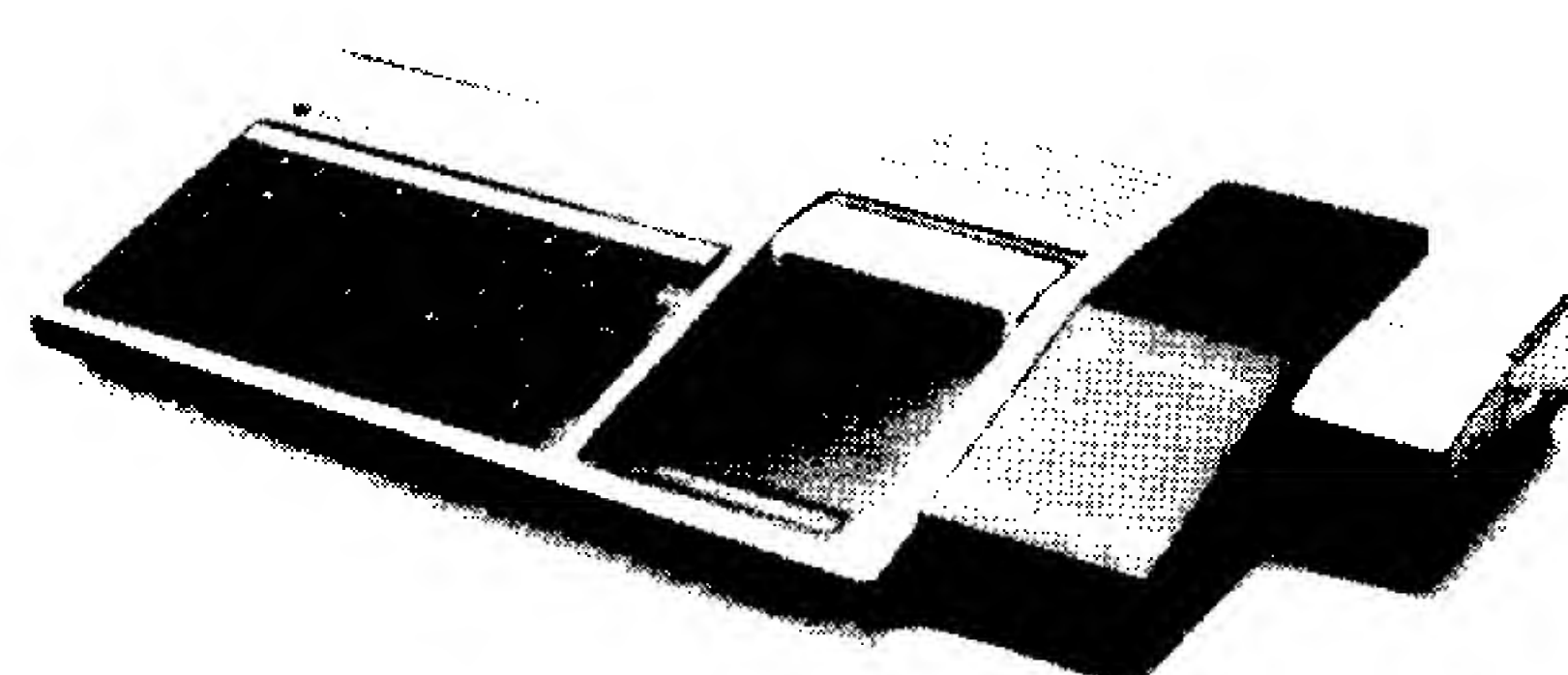
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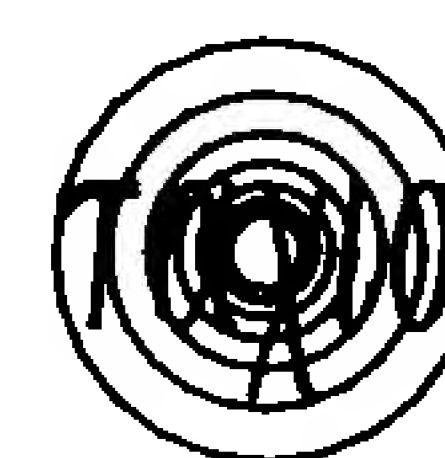
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# PRODUCT REVIEW

By Dana Nichols  
Managing Editor

For those of you who relish the thought of programming in Assembly language, *Learning TI 99/4A Home Computer Assembly Language Programming*, by Ira McComic, may be the instruction manual you've been looking for.

Published by Wordware Publishing, Inc., Plano, TX, the book's objective is this: to help you learn the TI Home Computer's Assembly language programs. Using this knowledge, you will in turn be able to understand existing Assembly language programs, customize programs and create your own Assembly language programs.

Consisting of 331 pages, this book covers a lot of ground. From Chapter 2, "What is Assembly Language" to Chapter 19, "Machine Code Formats," the manual provides an extensive amount of information concerning Assembly language.

In short, the chapters are as follows: Introduction, What is Assembly Language, the Structure of Data, the Structure of the TI Home Computer, Anatomy of Assembly Language

Statements, Instruction Set Overview, Addressing Formats: General, Addressing Formats: Immediate and PC-Relative, Introduction to the Editor and Assembler, Introduction to the Loader and Debugger, Data Movement Instructions, Compare Instructions, the Jump Instructions, the Arithmetic Instructions, the Logical Instructions, Branch and Subroutine Instructions, CRU and External Instructions, Other Assembly Language Concepts, Machine Code Formats, and the Summary.

Each chapter is packed with useful information; you'll find no wasted space in this book. For example, Chapter 13 covers these aspects of Assembly language programming:

The Equal Testing Instructions (JEQ and JNE)  
The Carry Testing Instructions (JOC and JNC)  
The Jump if No Overflow Instruction (JNO)  
The Jump if Odd Parity Instruction (JOP)  
The Logical Evaluation Instructions (JH, JHE, JLE, JL)

The Arithmetic Evaluation Instructions (JGT and JLT)  
The Jump Unconditionally Instruction (JMP)  
Program Example.

In addition to the main chapters in the book, Chapter one provides an introduction and overview of the book, while Chapter 20 consists of a Summary. Three Appendices; A. Instruction Summaries, B. Number Tables, and C. ASCII Character Table, provide even more useful background material. An index is also found at the end of the book.

Learning TI 99/4A Home Computer Assembly Language Programming is available immediately for a suggested retail price of \$16.95 from Wordware Publishing, Inc., 4217 Country Club Drive, Plano, TX 75074. If you wish additional information write or call at (214)423-0090.

A useful and much needed application, Sprite Builder is a handy program and guidebook to help you design your own double size sprites. The manual is very well documented and instructions are clear and precise.

Numerous examples are included,

(continued on page 18)

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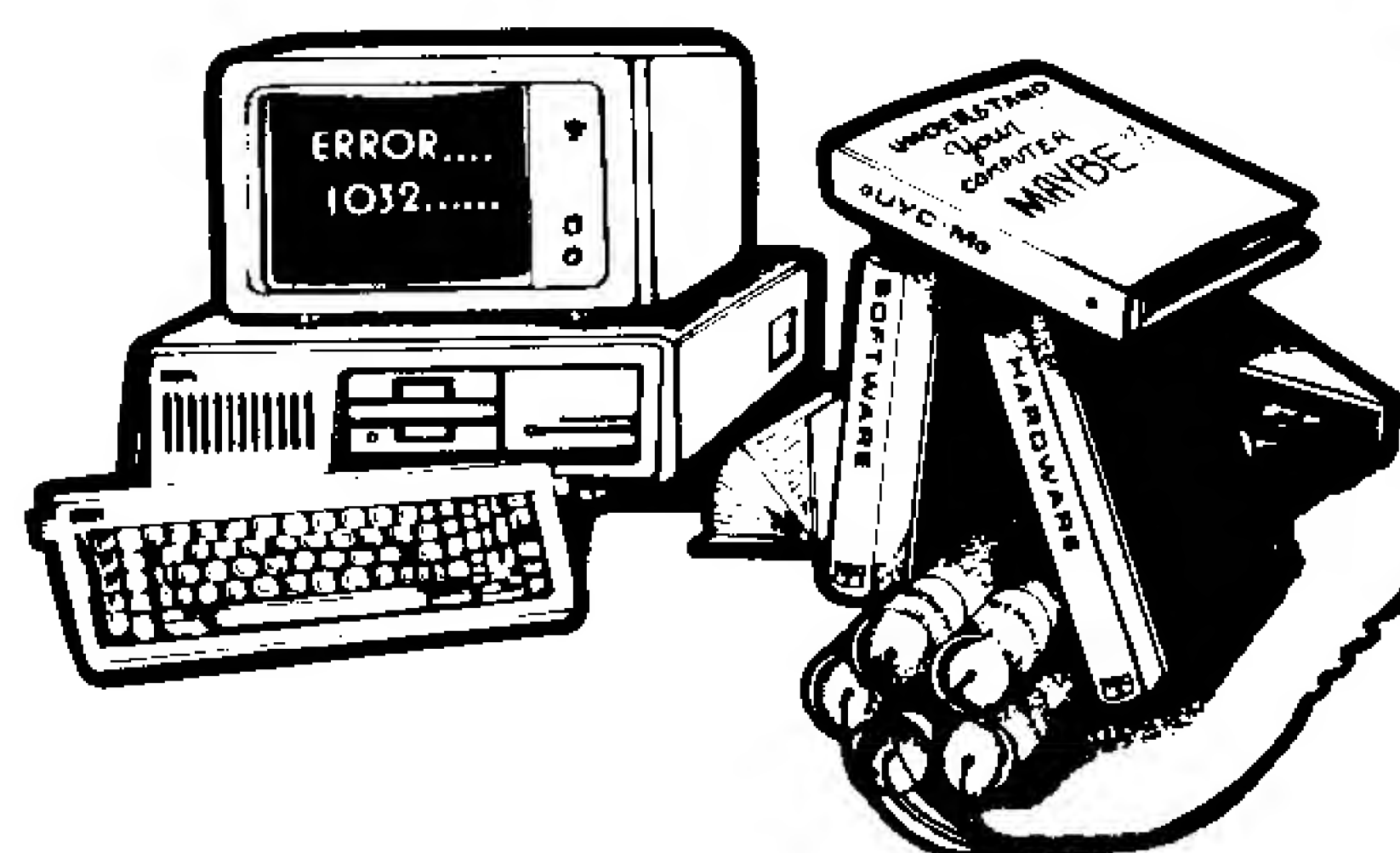
A keystroke-by-keystroke sample session provides fast hands-on experience for impatient users, building immediate confidence and understanding. Bite-sized modules let you learn even the most complex operations in minutes.

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# SOFTWARE

## THREE NEW TITLES ADDED TO MASTER 99 SERIES

By Tracy Caine  
IUG Librarian

The International 99/4 Users-Group is proud to announce three new additions to the Master 99 Series of programs. Sprite Designer, Caverns and Tafara join an elite collection of programs dedicated to specific individual purposes for the serious owner of the Texas Instruments 99/4A Home Computer, and are available from the IUG for \$14.95 each.

### **M9-250 Sprite Designer by R.L. McAllister**

This program enables you to design and use sprites and characters with relative ease. Now, even an inexperienced programmer can design and use high quality graphics such as those used in arcade type games or other special applications programs. Sprite Designer requires Extended BASIC, 32K Memory Expansion, and disk drive system.

### **Caverns, by Paul Pichette M9-260 Cassette for Mini-Memory M9-261 Disk for Extended BASIC M9-262 Disk for Editor/Assembler**

Helping Tim Suskevana save the Suskavana Hat Company from the evil banker, Simon, and mortgage foreclosure is your task in Caverns. A one-player game, Caverns features four different screens, or levels, of play. Completion of each screen brings you and Tim closer to the gold which will help save his company.

Your first goal is to get Tim to his helicopter at the top of his company. But deathly spiders abound and the evil banker, Simon, is there to hurl fireballs at Tim.

Throughout the journey, armed only with a boomerang, you must help Tim climb the rope bridges, cross the cavern and enter the gold mine. You are in constant danger with spiders, gremlins and other moving obstacles intent on seeing Simon foreclose on Tim's mortgage. During extended play, they will disappear from the screen, but don't let your guard down . . . they're not gone!

You can use either the arrow keys or

the joystick to play, and getting the hang of moving Tim across each screen is no easy task. Add to this the fact that Tim is constantly dodging spiders and fireballs, and you have fast action from the very beginning. Fortunately for we novices, there is an extended number of "Tims" provided in the practice mode.

Pressing '1' starts a regular game which consists of a total of four 'Tims' and 2000 seconds. Pressing '2' starts a practice game with 16 Tims and 4100 seconds on the counter. Pressing '3' provides a demonstration.

Scoring is as follows: jumping a moving object, 40; hitting a moving object with the boomerang, 100; catching the boomerang, 150, and each piece of gold, 2000. Bonus points are awarded at the end of each new screen by multiplying the time remaining by 10. At the end of each

payment of gold, you receive the time remaining multiplied by 100. For every 10,000 points, you receive one bonus "Tim."

Action is fast; in fact, when first written, it was so fast play was impossible! Caverns is one of the most challenging games we have seen in a long time, and can be enjoyed by the entire family.

(continued on page 35)

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# BUGOUT — THE ASSEMBLY LANGUAGE DEBUGGER YOU'VE BEEN WAITING FOR!

By Terry Helm  
Staff Technical Writer

For over a year, loyal Assembly language enthusiasts of the 99/4A Home Computer have all been asking and waiting for the same thing — and until now, it's been unavailable. Since TI announced there would be no Advanced Assembly Debugger, the search has been on at the International 99/4 Users-Group for a fast, convenient and fairly inexpensive debugger. The situation looked hopeless until Greg Wonderly, an Oklahoma State university senior majoring in computer science, developed Bugout.

The Bugout Machine Language Monitor allows the Assembly language programmer to execute, test and debug his programs in a way previously available only in high level languages. Every aspect of this debugger has been designed to curtail the number of early morning hours currently spent by so many programmers trying to figure out where their program ended up before the computer locked up.

The display screen is broken into four major parts. The top eight lines are reserved for examination of memory contents. The next nine lines are used for disassembled code. This is followed by five "general communications" lines (used for error messages and the like). The bottom line is the command line.

Characters appear in the Editor/Assembler text format (i.e., 40 columns/line) and the screen color is black on light green. I found this color arrangement to be a welcome break from the white on blue of the Editor/Assembler, but it is possible to change both character color and screen color to suit your taste.

Several different display options are available for the disassembled code. You can choose from signed or unsigned values with decimal or hexadecimal representation. If any value matches up with a symbol in the REF/DEF table, that symbol is substituted into the disassembly. The disassembly or the memory contents can not only be printed on the screen, but can also be written to any external file except cassette.

All commands are entered via cursor editing like a BASIC "INPUT" command. The commands are two or three letters followed by any necessary parameters. For example, to examine memory contents at 8300, the command "ME8300" where ME is the syntax required to examine CPU RAM. To browse through VDP RAM, just use "MV(address)". You can scroll up or down by using the arrow keys. The disassembly process is similar.

"DI8300" disassembles CPU RAM starting at 8300 and again, you can scroll up or down.

Bugout features in-step disassembly and cursor editing of hexadecimal dumps from CPU RAM, VDP RAM, GROM/RAM devices and CRU I/O bits. Other features of Bugout include the ability to transfer blocks of memory from one location to another and the ability to search any part of memory and find any particular instruction, keyword, ASCII string or value. TMS/9900 tagged object code can also be loaded and executed. And the list goes on.

Perhaps the most important feature of Bugout is single/multi-step execution. you can "step" through the program one instruction at a time or use up to sixteen multi-step breakpoints at once. This allows you to stop and look around at any time in the program or between each instruction. There is also an "interrupt dependent recovery," which simply means that when you press the CTRL, SHIFT and FCTN keys simultaneously, a direct branch is taken back to the entry point of Bugout. This has the effect of hitting FCTN-4 (CLEAR) in Extended BASIC.

The single stepper works as follows. When the single step routine is initiated, all instructions that do not affect the PC register are copied to a buffer and allowed to execute normally. Those instructions that do or could affect the PC register are only simulated. If an invalid instruction is found, control is transferred back to the debugger at that point.

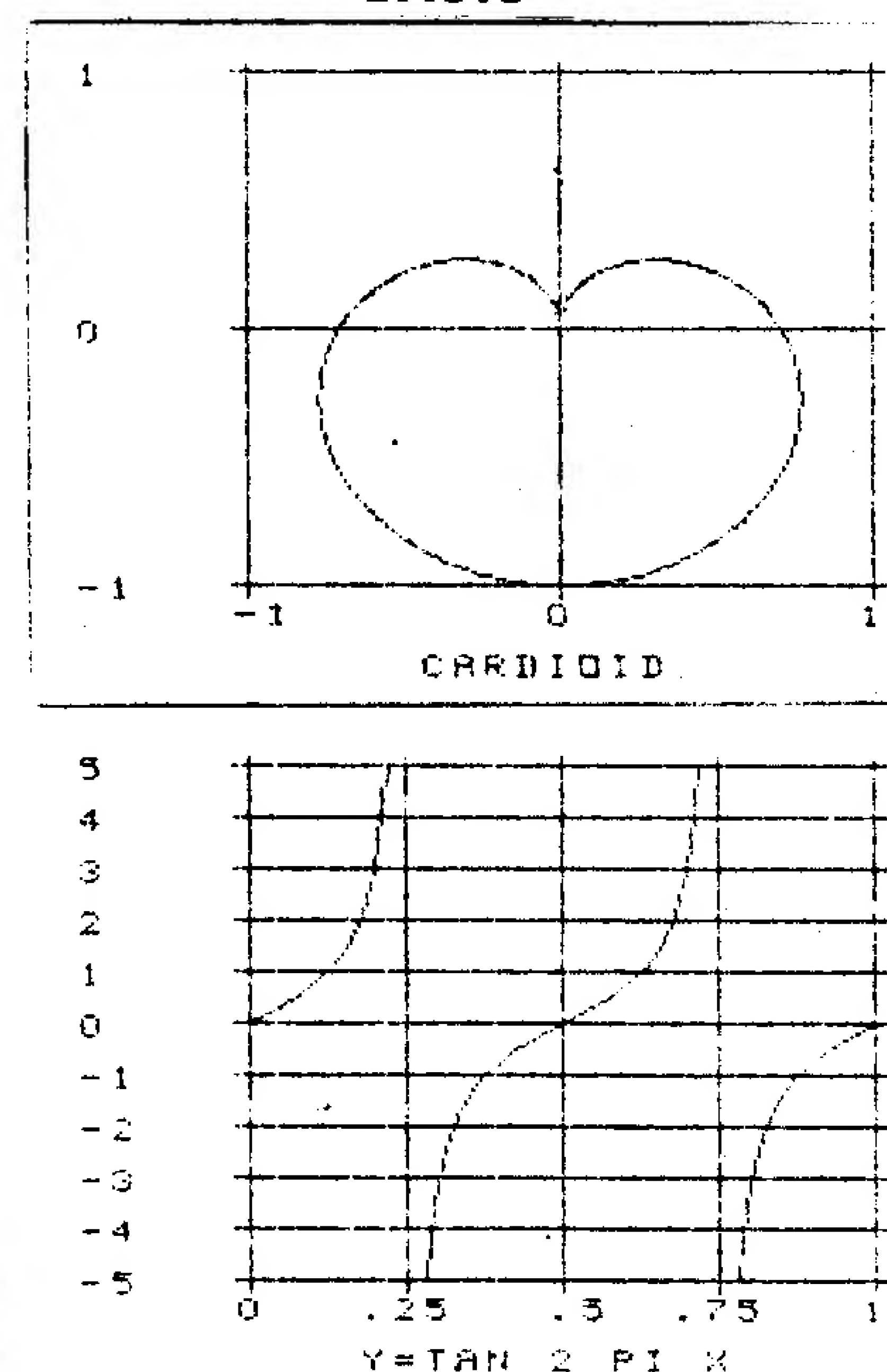
The debugger supplied with the Editor/Assembler also allows program execution with breakpoints. XOP and BLWP instructions are placed in the code and if you're lucky, the processor will reach one of these points and return control to TI BUG with the status of the program in registers 13-15. This method is, at best, inconvenient. Bugout lets you watch everything, even if something goes wrong. And if the processor runs into anything it can't handle, it shows you where and what.

Instructions for the TI BUG Monitor also mention a single step capability. The only stipulation is that it requires special CPU operated hardware to use. Bugout features a software implemented single step routine that executes a single valid instruction. Overall, Bugout is much superior to TI's debugger in the Editor/Assembler — it's the debugger TI should have written.

If you are one of the many people who has the Editor/Assembler and are interested in Assembly language programming, the Bugout Machine Language Monitor will prove to be an irreplaceable investment. For the first time on the 99/4A, there is an Assembly language programming tool that provides the features you need. Even if you haven't yet learned enough to understand some of this jargon, you will benefit greatly from this product as you learn. If you take advantage of the many functions of Bugout, you will soon wonder how you managed to get along without it. Just as every piece of apple pie should be topped with vanilla ice cream, every Editor/Assembler should be equipped with Bugout.

Bugout is available now from The Data Process for \$39.95. Address questions concerning Bugout to The Data Process, 7004 N.W. 63rd St., Bethany, OK 73008, or call (405) 728-0158.

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# PRODUCT REVIEW

(continued from page 14)

such as animals, people, letters of the alphabet and numbers. Beginning programmers will really benefit from this program, which requires Extended BASIC. Sprite Builder is available from CMS Systems, P.O. Box 11128, Huntsville, AL 35805.

Enjoy hours of fun in your "quest for the lily pad" with Super Frogger, from Norton Software. Play is simple. Hop Super Frog across five lanes of traffic, two barges and three logs and into one of the four home lily pads. Sound easy? Not so!

There are a few obstacles to block your path we might mention such as speeding cars, piranha infested waters, snakes, or crocodiles. Timing is important too. You're hopping against the clock, and a bad jump could mean an early death or a thorough dunking! Even your home lily pad requires an accurate jump.

Hopping onto the pad from a moving log is tricky!

You are given four frogs to play with, and the game is over when all frogs are gone. Scoring is as follows: obtaining square food pellet, 150; getting a frog home, 200; completing a screen, 500; and completing a screen without losing any frogs, 1000 points. Advanced levels of play are available, provided you know the password. It flashes on the screen sometime after the fourth screen, so be ready to hop to your heart's content!

Super Frogger requires Extended BASIC and is available on cassette for \$19.95. Diskette versions are \$4 extra and require the memory expansion system. Look for Super Frogger and a Special Offer from Norton Software, P.O. Box 3574 South, Halifax, N.S. Canada B3J3J3, in this issue of Enthusiast '99.

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"All the claims you make for COMPANION it satisfies, and more. Though I've had it running for slightly less than a week, I certainly find it easier and more pleasant to use than the WORDSTAR Professional Package on our IBM, and far more pleasant to manipulate than the BUSINESSPAK WORD+ software for my TRS Model 100. My only problem is that my son and daughter have virtually monopolized the TI system for the past week, churning out "optional" work for courses to give themselves excuses to experiment with the various features." *Dr. F.N. North Carolina*

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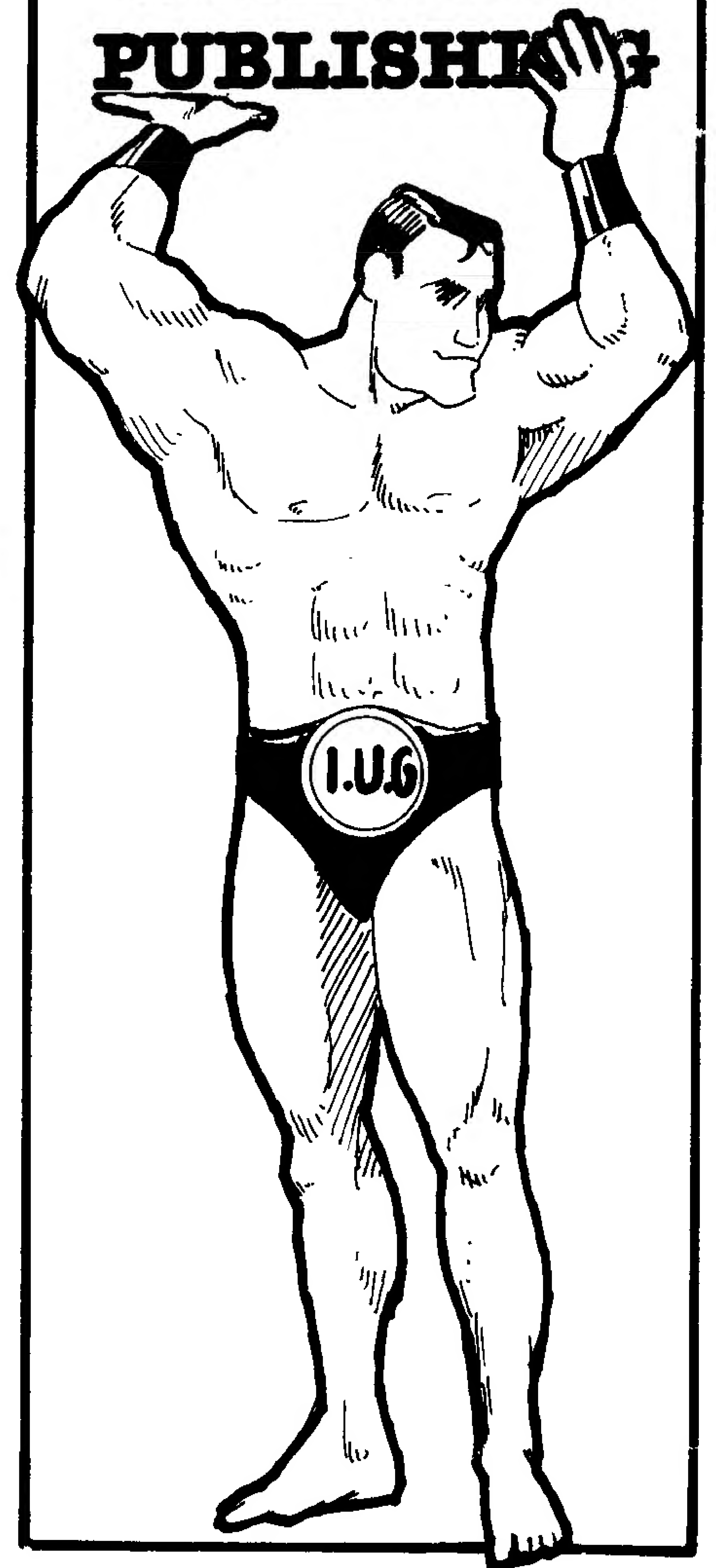
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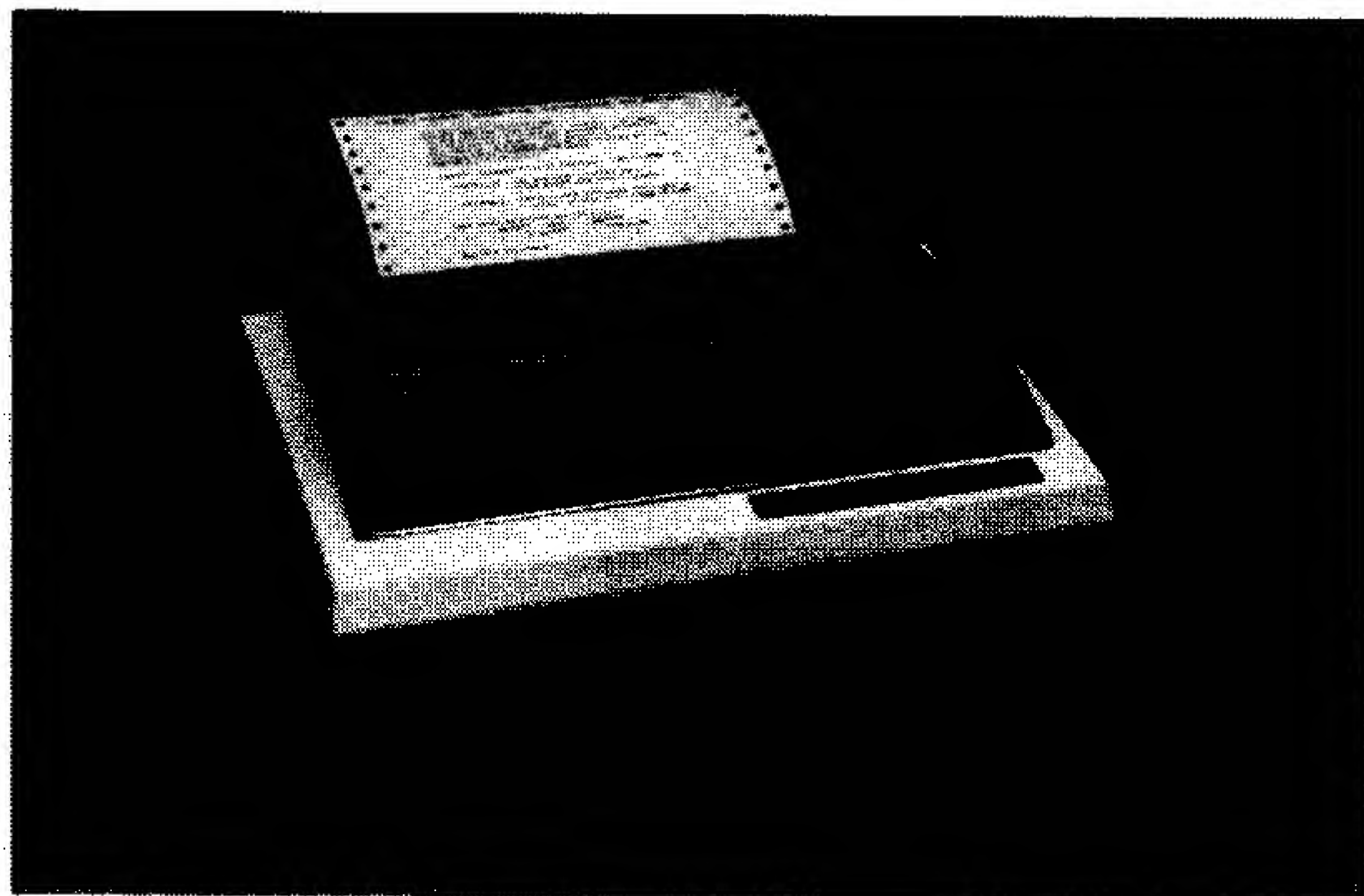




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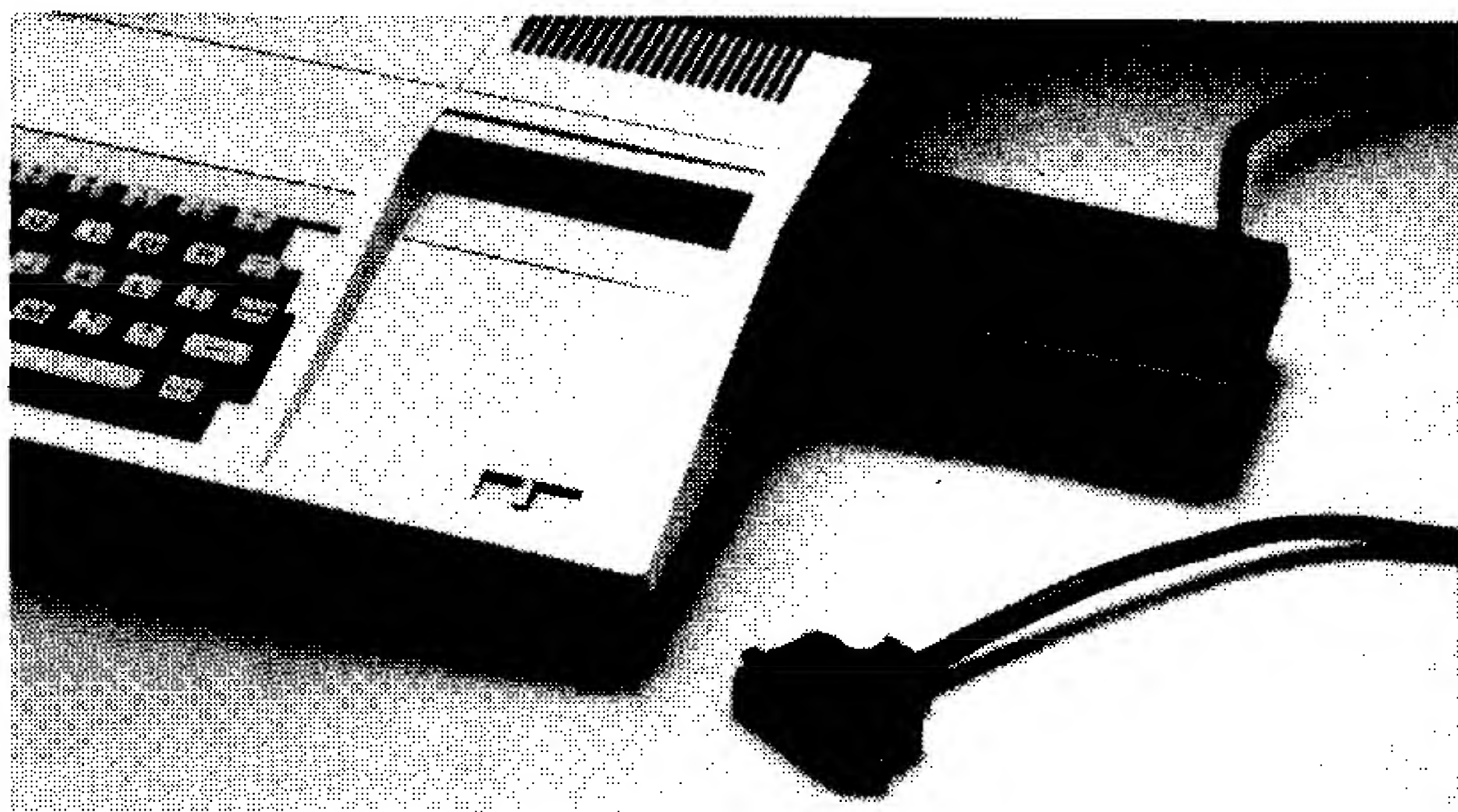
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# PROGRAMMING HINTS

## PUT YOUR MONEY WHERE YOUR MOUTH IS MORE ON STRUCTURED PROGRAMMING

By John Phillips

My last article was a discussion of Structured Programming and in it I made a quote stating "I could not even imagine an Assembly language program without structured programming." To be quite honest, I really could not. I would like to therefore present to you the Source Code (yes, folks, the actual Commented and Structured Source Code) for a "mini" Space Invaders game. Included are versions for both the MiniMemory and Editor/Assembler command modules.

The MiniMemory code is actually a disassembled listing of the object code generated by the Editor/Assembler. Please notice that the program is AORG'd to >7CD8, not >7C00 (which is the usual default). Since there are no symbols or labels in the Source Code, the object code may begin where the symbol table usually resides. You will need to enter a program name and an entry point in order to run the program later. To do this, follow these steps:

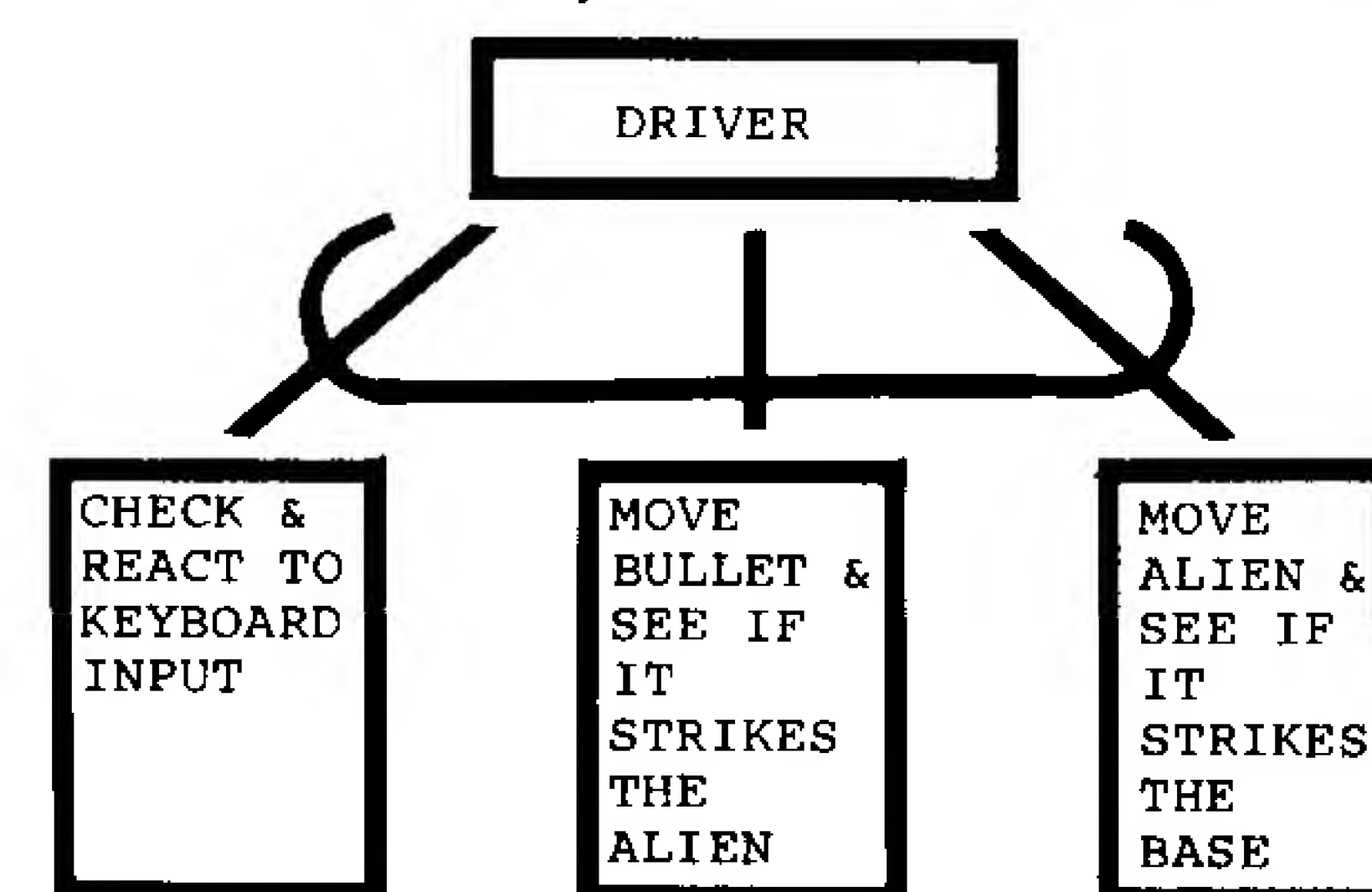
1. Before typing the last END statement, (SB) means Space Bar, Type (SB) AORG 701E and press ENTER.
2. Type (SB) DATA >7FF8 and press ENTER.
3. Type (SB) AORG >7FF8 and press ENTER.

4. Type (SB) TEXT 'VADERS' and press ENTER.
5. Type (SB) DATA >7CD8 and press ENTER.
6. Type (SB) END and press ENTER.

When the MiniMemory menu screen appears, select the RUN option by pressing 2. Enter 'VADERS' for your program name and away it goes! If the program does not run, chances are you've made a typing error. The disassembled listing contains the program counter values on the far left side, so make sure the line you are typing matches the program counter displayed on the screen when using the LINE-BY-LINE ASSEMBLER. If you've skipped a line or mistyped a line, use the AORG directive to back up and correct it. However, if you have already entered the last END directive, use EASY BUG to correct any mistakes . . . the OLD program will gobble up the first 4 bytes of your program. If you do use the OLD program, be sure and restore the first four bytes to >02E0, >8300 (LWPI >8300). Once you have the program running, be sure and save it to tape using EASY BUG. Save addresses >7000 to >7FFF.

Now let's talk about structure. Please refer to the Editor/Assembler listing.

When I conceptualized the game, I defined three processes as shown below:



Up near the beginning of the Source Code is a module called the MAIN DRIVER. It consists of four lines:

```
MD  BL @IN      INPUT
     BL @MB      MOVE BULLET
     BL @MA      MOVE ALIEN
     JMP MD      LOOP AROUND
```

The driver was the first four lines of code that I wrote. Every other module was based on the requirements of the driver. I wrote the subroutine for @IN, followed by @MB and @MA, in that order. Of course, I needed sprites on the screen, but those processes took place before the main driver, so a section of code was defined INITIALIZATION ROUTINES to take care of pre-driver tasks. Please notice that the driver DOES NOT care what goes on in @IN, @MB, and @MA. Its only concern is to keep looping and calling subordinate modules.

I hope you also notice that virtually every line of code has a comment on it and every major module has a comment block defining its function. Even if you can't program in Assembly, I'm sure you can follow my logic and understand what my code is doing. That is the beauty of structured programming!

I've introduced a technique to help in your quest for structured programming. This is for all you aspiring Assembly language programmers out there. Find the label BS in the move bullet subroutine. The fourth line down from there reads:

```
BL @CR
DATA >304,>308
```

This is a technique for parameter passing in Assembly language. When the Bl is executed, the program counter is

at last!

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incremented by four bytes and that value is tucked away in R11. The address of the new routine is stuffed in the program counter (PC) and execution begins at the new address. The first two lines of the @CR subroutine are:

```
CR    MOV *R11+,R0
      MOV *R11+,R10
```

This may seem a bit strange or confusing, but it really is a neat way of accomplishing parameter passing. Recall that R11 is pointing four bytes past the calling BL. In our case, R11 points right at the DATA >304,>308 statement. Using R11, we can get those bytes of data into registers, or CPU addresses with the above two statements. The first statement moves one word of data from the address pointed to by R11 into R0 and increments R11 by 2. Now R11 is pointing at the >308. The second statement moves the >308 into R10 and increments R11 by 2 again. Now R11 is pointing to the executable

statement following the unexecutable DATA statements. If R11 was not properly incremented, it would point back to the DATA statements upon its return, and who knows what it would do since DATA statements are not executable.

This form of parameter passing is also space saving. For example:

```
LI R0,>300
LI R1,SD
LI R2,21
BLWP @VMBW (OR >6028 FOR MM)
```

These statements use 16 bytes of code: Now consider this example:

```
BL @VMBWS
DATA >300,SD,21
```

```
VMBWS MOV *R11+,R0
      MOV *R11+,R1
      MOV *R11+,R2
      BLWP @VMBW
      B *R11
```

The calling lines use only 10 bytes, so each time you used the latter format you would save six bytes. Now consider the number of times you load up those three registers to write to or read from VDP memory. The savings over the long run will be astronomical. I used this technique in this program to pass down which sprites I want checked for coincidence, using their Sprite Attribute List starting address as data. I hope this will give you some ideas of your own.

In any case, study my code carefully and try and visualize the program you are currently creating from a structured standpoint. The debugging time will be cut to nominal proportions and six months from now, when you decide to pick up that program again, you can jump right back into it without first figuring out just what you did in the first place.

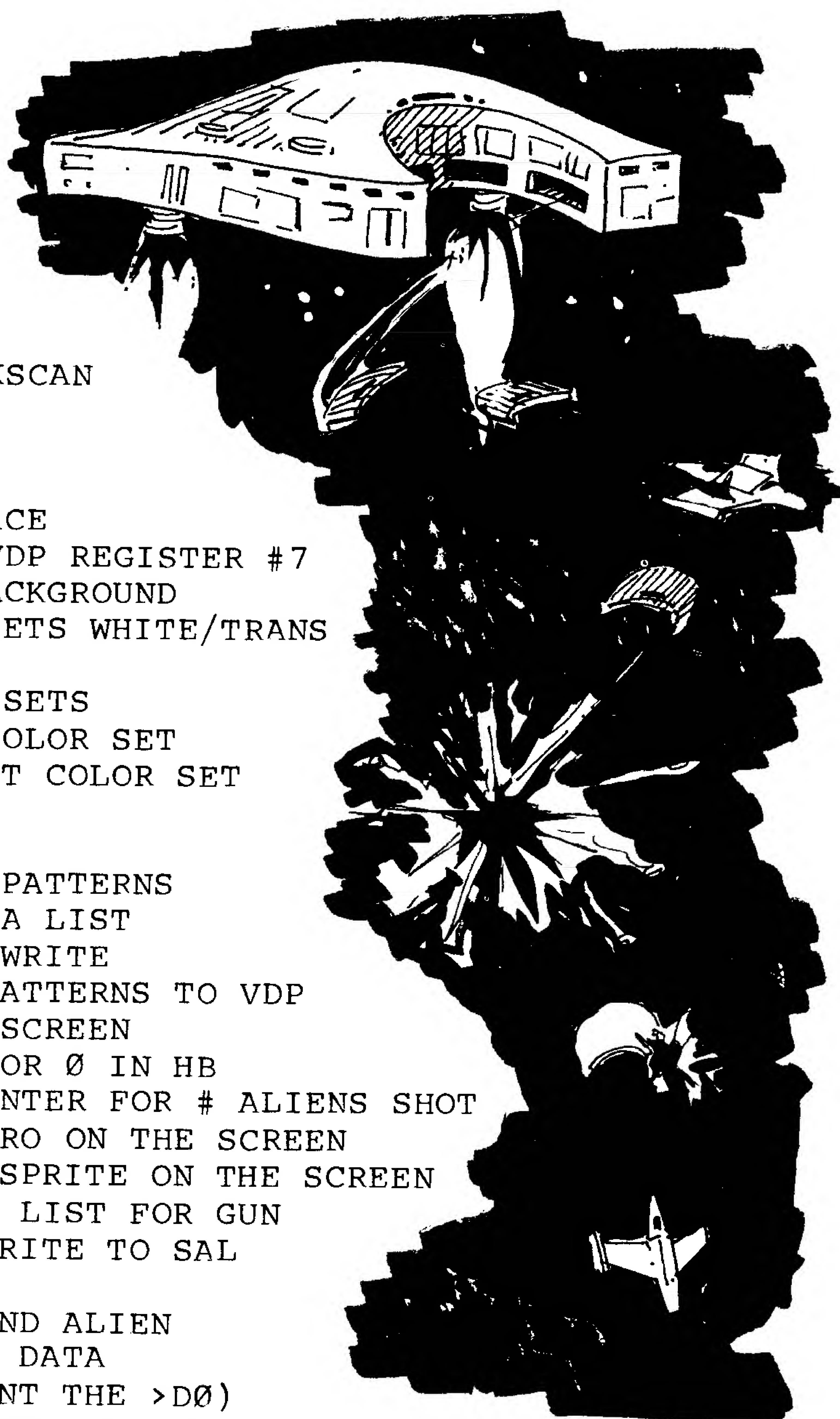
```
*****
* "MINI SPACE INVADERS"
* BY JOHN PHILLIPS
* 641 SUNNY SLOPE
* ALLEN, TX 75002
* DATE STARTED : MARCH 15, 1984
* DATA FINISHED: MARCH 15, 1984
* VERSION 1.0
*****
```

```
DEF VADERS
```

```
REF VSBW,VMBW,VSBR,VMBR,VWTR,KSCAN
```

```
*****
* INITIALIZATION ROUTINES, ETC.
*****
```

VADERS	LWPI >8300	LOAD WORKSPACE
	LI R0,>0711	WRITING TO VDP REGISTER #7
	BLWP @VWTR	FOR BLACK BACKGROUND
	LI R0,>384	COLOR CHAR SETS WHITE/TRANS
	LI R1,>F000	WHITE/TRANS
	LI R2,8	8 CHARACTER SETS
L0	BLWP @VSBW	WRITE TO 1 COLOR SET
	INC R0	POINT TO NEXT COLOR SET
	DEC R2	DONE WITH 8?
	JNE L0	NOT YET
	LI R0,>400	LOAD SPRITE PATTERNS
	LI R1,SP	POINT TO DATA LIST
	LI R2,32	32 BYTES TO WRITE
	BLWP @VMBW	OUT GO THE PATTERNS TO VDP
GS	LI R0,>10	PUT ZERO ON SCREEN
	LI R1,>3000	ASCII CODE FOR 0 IN HB
	MOVB R0,@>8320	ZERO OUT COUNTER FOR # ALIENS SHOT
	BLWP @VSBW	PLACE THE ZERO ON THE SCREEN
G1	LI R0,>300	PUT THE GUN SPRITE ON THE SCREEN
	LI R1,BG	POINT TO SAL LIST FOR GUN
	LI R2,4	4 BYTES TO WRITE TO SAL
	BLWP @VMBW	OUT TO VDP
G2	LI R0,>304	PUT BULLET AND ALIEN
	LI R1,BG+4	POINT TO SAL DATA
	LI R2,9	9 BYTES (COUNT THE >D0)
	BLWP @VMBW	OUT GO THE REST OF THE SPRITES





```

LI R0,>FF00
MOVB R0,@>8323
SWPB R0
MOVB R0,@>8321
MOVB R0,@>8322
LI R0,>08
MOVB R0,@>8324

```

```

MOVE ALIEN TO THE LEFT
START HIM GOING LEFT
GET A >00 IN THE HIGH BYTE
FLAG FOR NO BULLET
ALLOW ALIEN TO MOVE RIGHT AWAY
DELAY COUNTER
SET MASTER DELAY COUNTER

```

```

*****
*
*  M A I N   D R I V E R
*
*  AN EXAMPLE OF "PERFECT"
*  STRUCTURED CODING!
*
*****

```

```

MD      BL @IN
        BL @MB
        BL @MA
        JMP MD

```

```

INPUT
MOVE BULLET
MOVE ALIEN
LOOP AROUND

```

```

*****
*  INPUT ROUTINE
*
*****

```

```

IN      MOV R11,R13
        CLR @>8374
        BLWP @KSCAN
        MOVB @>8375,R3
        ANDI R3,>FF00
        CI R3,>FF00
        JNE GK
        JMP IR
GK      CI R3,>5300
        JEQ LG
        CI R3,>4400
        JEQ RG
        CI R3,>2E00
        JEQ FG
IR      B *R13

```

```

SAVE RETURN
CLEAR KEYBOARD
GET KEY
COPY KEY VALUE
MASK LOW BYTE
KEY PRESSED?
YES, SO PROCESS
NO, SO EXIT
LEFT KEY?
YES, SO JUMP TO LEFT ROUTINE
RIGHT KEY?
YES, SO JUMP TO RIGHT ROUTINE
"." BUTTON?
YES, SO JUMP TO FIRE ROUTINE
WRONG KEY

```

```

*****
*  LEFT MOVEMENT
*
*****

```

```

LG      LI R0,>301
        BLWP @VSB
        SRL R1,8
        CI R1,8
        JH ML
        JMP IR
ML      DEC R1
        JMP CV

```

```

READ XPOS OF GUN SPRITE
INTO R1HB
ADJUST POS TO LSB
AT LEFT EDGE?
NO, SO CONTINUE
YES, SO CAN'T MOVE
DECREMENT X POSITION
MOVE BACK TO MSB

```

```

*****
*  RIGHT MOVEMENT
*
*****

```

```

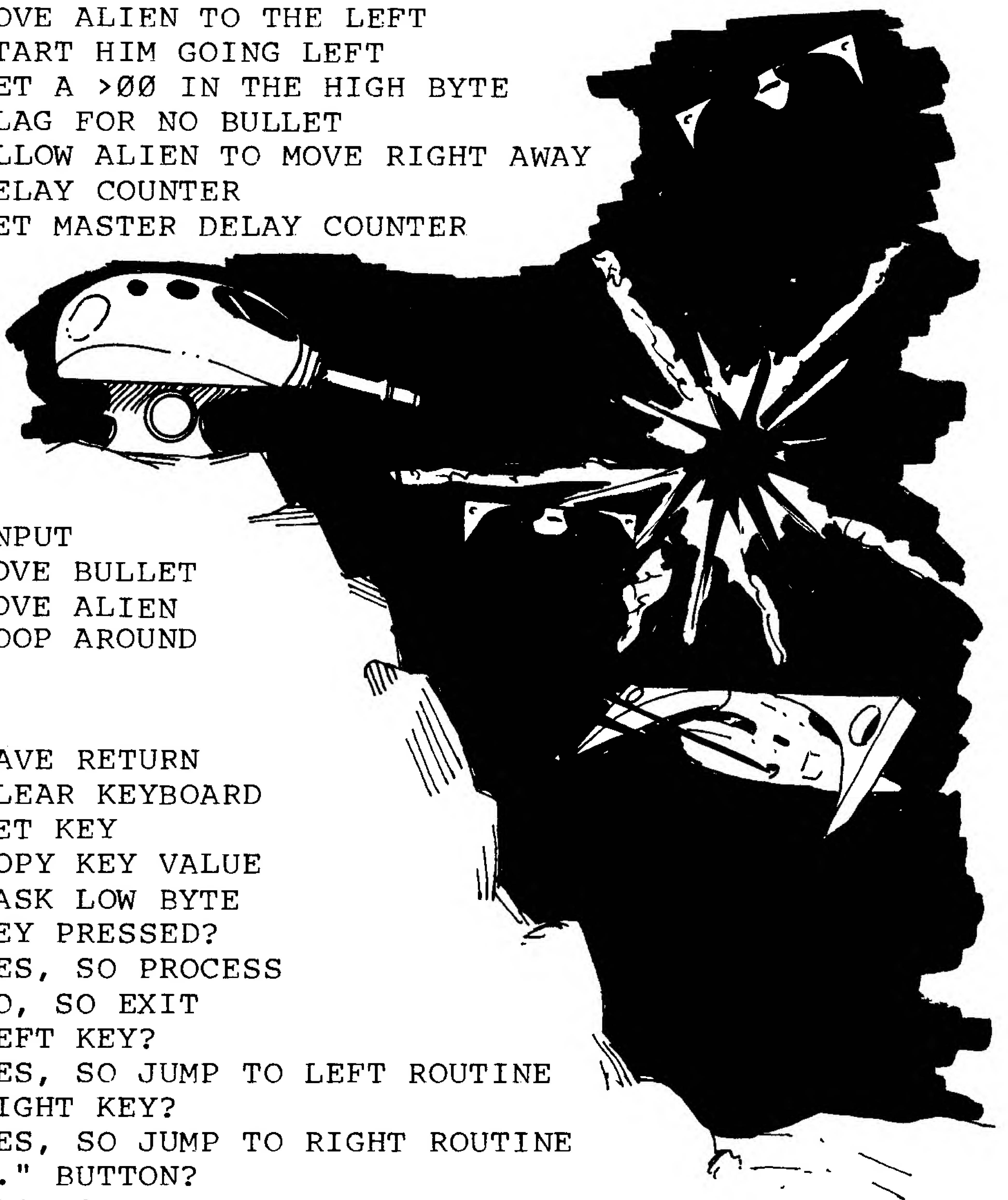
RG      LI R0,>301
        BLWP @VSB
        SRL R1,8
        CI R1,240
        JL MR
        JMP IR
MR      INC R1
CV      SWPB R1

```

```

READ XPOS OF GUN SPRITE
INTO R1HB
ADJUST TO LSB
AT RIGHT EDGE?
NO, SO CONTINUE
YES, SO CAN'T MOVE
INCREMENT POSITION
MOVE BACK TO MSB

```



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```

EX      BLWP @VSBW      AND WRITE NEW POSITION
      JMP IR      AND EXIT
*****
* FIRE ROUTINE *
*****
FG      MOV B @>8321,R0      BULLET ON?
      JEQ MF      NO, SO FIRE AWAY
      JMP IR      YES, SO EXIT
MF      LI R0,>300      READ Y,X OF GUN
      LI R1,>8306      READ INTO R3
      LI R2,2      2 BYTES
      BLWP @VMBR      READ USING UTILITY
      C *R0+,*R0+      ADD 4 TO R0
      BLWP @VMBW      PUT BULLET WHERE GUN IS
      MOV B R0,@>8321      FLAG SAYS BULLET IS ON
                          SCREEN
      JMP EX      AND EXIT ROUTINE
*****
* MOVE BULLET AND TEST COINC *
*****
MB      MOV R11,R14      SAVE RETURN
      MOV B @>8321,R0      BULLET ON?
      JNE BO      YES
BR      B *R14      NO, SO EXIT MODULE
BO      LI R0,>304      READ BULLET Y POS
      BLWP @VSBW
      SRL R1,8      ADJUST TO LSB
      CI R1,16      AT TOP?
      JH BS      NO, SO BULLET STAYS
      MOV B R1,@>8321      NO BULLET ON SCREEN
      LI R1,>C000      PLACE OFFSCREEN
      BLWP @VSBW
BS      JMP BR      AND EXIT
      DEC R1      MOVE 1 HIGHER
      SLA R1,8      RESTORE
      BLWP @VSBW      AND REWRITE Y POS
      BL @CR      TEST COINC ON BULLET
                          AND ALIEN
      DATA >304,>308      PASS THE 2 SAL LOCATIONS
      MOV R3,R3      HIT?
      JEQ BR      NO
      LI R0,>0766      FLASH RED SCREEN
      BLWP @VWTR
      LI R4,NL      POINT TO SOUND LIST
      LI R5,2      2 BYTES TO LOAD
NN      MOV B *R4+,@>8400      FEED A SOUND BYTE
      DEC R5      DONE WITH BOTH BYTES
      JNE NN      NOT YET
      LI R0,>400      DELAY
D      DEC R0      DONE?
      JNE D      NOT YET
      MOV B *R4,@>8400      SHUT OFF SOUND
      MOV B R0,@>8321      NO MORE SHOT ON SCREEN
      LI R0,>0711      RESTORE BLACK BACKGROUND
      BLWP @VWTR
      LI R0,>0100      ONE MORE HIT
      AB R0,@>8320
      LI R0,>0A00      COMPARE # OF HITS TO TEN
      CB @>8320,R0      GET OUR TENTH ALIEN?

```

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```

      JL N1
      LI R1,YW
      JMP GO
N1    MOVB @>8320,R1
      AI R1,>3000
      LI R0,>10
      BLWP @VSBW
      B @G2

```

\*\*\*\*\*

\* GAME OVER \*

\*\*\*\*\*

```

GO    LI R0,>18B
      LI R2,10
      BLWP @VMBW
DB    BLWP @KSCAN
      LI R4,>FF00
      CB @>8375,R4
      JNE DB
WK    BLWP @KSCAN
      CB @>8375,R4
      JEQ WK
      LI R1,BL
      BLWP @VMBW
      B @GS

```

\*\*\*\*\*

\* MOVE ALIEN AND TEST COINC \*

\*\*\*\*\*

```

MA    MOV R11,R15
      MOVB @>8322,R0
      JEQ AM
      LI R0,>0100
      SB R0,@>8322
AR    B *R15
AM    MOVB @>8324,@>8322
      LI R0,>309
      BLWP @VSBW
      SRL R1,8
      MOVB @>8323,R5

```

```

      JLT AL
AG    CI R1,240
      JL CM
      LI R3,-1
      JMP AN
AL    CI R1,8
      JH CM
      LI R3,1
AN    SLA R3,8
      MOVB R3,@>8323
      DEC R0
      BLWP @VSBW
      AI R1,>0800
      BLWP @VSBW
CM    LI R0,>309
      BLWP @VSBW
      AB @>8323,R1
      BLWP @VSBW

```

\*

```

      INC R0

```

```

NO, SO CONTINUE GAME
SET VECTOR FOR WIN MESSAGE
YES, SO GAME IS OVER
GET #SHOTS
ADD ASCII OFFSET
SCREEN SPOT FOR SCORE
WRITE NEW SCORE DIGIT
AND CONTINUE GAME

```

```

MESSAGE SPOT
10 BYTES
WRITE MESSAGE
GET KEY
COMPARE VALUE
KEY PRESSED?
YES, SO HASN'T LET GO
GET KEY
KEY PRESSED?
NO, SO NO NEW KEY PRESSED
BLANK ANY MESSAGE
AND RESTART ACTION

```

```

SAVE RETURN LINK
MOVEMENT DELAY UP?
YES, SO MOVE
DECREMENT VALUE
DECREMENT DELAY COUNTER
EXIT
RESET DELAY IN
POINT TO X OF ALIEN
READ X
MOVE TO LSB
WHICH DIRECTION IS ALIEN
HEADING?
LEFT
AT RIGHT EDGE?
NO, SO MOVE
NEW DIRECTION
BRANCH AROUND LEFT CODE
AT LEFT EDGE?
NO, SO KEEP MOVING
NEW DIRECTION
NEW DIR
RESET VARIABLE
POINT TO ALIEN Y
GET Y
MOVE DOWN 8
AND WRITE NEW POSITION
NOW POINT TO X
READ X
MOVE IN NEW DIRECTION
AND WRITE IT TO VDP

```

```

POINT TO CHAR BYTE

```

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```

        BLWP @VSBR          READ CHAR
        SRL R1,8            ADJUST
        CI R1,>82           FIRST PATTERN?
P1      JEQ P2              YES, SO MAKE SECOND
        DEC R1              NO, SO MAKE FIRST PATTERN
        JMP P
P2      INC R1              MAKE SECOND PATTERN
P       SWPB R1
        BLWP @VSBW         REWRITE PATTERN
        BL @CR             COINC ON BASE AND ALIEN?
        DATA >300,>308     PASS TWO SPRITE SALS
        MOV R3,R3          HIT?
        JEQ AR             NO, SO CONTINUE
        LI R1,OM           LOAD VECTOR FOR GAME OVER MESSAGE
        B @GO              YES, SO GAME OVER
*****
* COINCIDENCE ROUTINE. SPRITES *
* TO BE CHECKED ARE PASSED AS *
* DATA. RETURN IS R11.      *
*****
CR      MOV *R11+,R0        FIRST SPRITE
        MOV *R11+,R10       SECOND SPRITE
        LI R1,>830A         READ FIRST SPRITE'S Y,X INTO R5
        LI R2,2             TWO BYTES
        BLWP @VMBR         READ THEM
        MOV R10,R0         NOW SECOND SPRITE'S Y,X
        LI R1,>830E         INTO R7
        BLWP @VMBR         REA THEM
        MOV R5,R6          COPY Y,X
        SRL R5,8           Y IN 5
        ANDI R6,>00FF      X IN 6
        MOV R7,R8          COPY Y,X
        SRL R7,8           Y IN 5
        ANDI R8,>00FF      X IN 6
        S R5,R7            Y DELTA
        S R6,R8            X DELTA
        ABS R7             POSITIVE
        ABS R8             POSITIVE
        CI R7,4            WITHIN 4?
        JH NC              NO
        CI R8,4            WITHIN 4?
        JH NC              NO
        SETO R3            GOT A COINC
        JMP RC             AND EXIT
NC      CLR R3             NO COINC
RC      B *R11             RETURN
*****
* DATA STATEMENTS HERE *
*****
NL      DATA >F0E2,>FF00   DATA FOR SOUND LIST
SP      DATA >1818,>1818,>3C7E,>7E3C  DATA FOR SPRITE PATTERNS
        DATA >0010,>0810,>0810,>0800
        DATA >423C,>5A3C,>2424,>2400
        DATA >243C,>5A3C,>2442,>8100
BG      DATA >A080,>8004,>C080,>810F  BULLET AND GUN SAL DATA
AS      DATA >1080,>8207,>D000        ALIEN SAL DATA
OM      TEXT 'GAME OVER'          GAME OVER MESSAGE
YW      TEXT 'YOU WIN!!!'         WIN MESSAGE
BL      TEXT '                  '  BLANK LINE MESSAGE
*
END

```



# SPACE INVADERS — MINI MEMORY

7CD8	02E0	AORG >7CD8	7D4C	0200	LI R0,>0008
7CDA	8300	LWPI >8300	7D4E	0008	
7CDC	0200	LI R0,>0711	7D50	D800	MOVB R0,@>8324
7CDE	0711		7D52	8324	
7CE0	0420	BLWP @>6034 (VWTR	7D54	06A0	BL @>7D62
7CE2	6034		7D56	7D62	
7CE4	0200	LI R0,>0384	7D58	06A0	BL @>7DE6
7CE6	0384		7D5A	7DE6	
7CE8	0201	LI R1,>F000	7D5C	06A0	BL @>7EAE
7CEA	F000		7D5E	7EAE	
7CEC	0202	LI R2,>0008	7D60	10F9	JMP >7D54
7CEE	0008		7D62	C34B	MOV R11,R13
7CF0	0420	BLWP @>6024 (VSBW	7D64	04E0	CLR @>8374
7CF2	6024		7D66	8374	
7CF4	0580	INC R0	7D68	0420	BLWP @>6020 (KSCAN)
7CF6	0602	DEC R2	7D6A	6020	
7CF8	16FB	JNE >7CF0	7D6C	D0E0	MOVB @>8375,R3
7CFA	0200	LI R0,>0400	7D6E	8375	
7CFC	0400		7D70	0243	ANDI R3,>FF00
7CFE	0201	LI R1,>7F88	7D72	FF00	
7D00	7F88		7D74	0283	CI R3,>FF00
7D02	0202	LI R2,>0020	7D76	FF00	
7D04	0020		7D78	1601	JNE >7D7C
7D06	0420	BLWP @>6028 (VMBW	7D7A	1009	JMP >7D8E
7D08	6028		7D7C	0283	CI R3,>5300
7D0A	0200	LI R0,>0010	7D7E	5300	
7D0C	0010		7D80	1307	JEQ >7D90
7D0E	0201	LI R1,>3000	7D82	0283	CI R3,>4400
7D10	3000		7D84	4400	
7D12	D800	MOVB R0,@>8320	7D86	130F	JEQ >7DA6
7D14	8320		7D88	0283	CI R3,>2E00
7D16	0420	BLWP @>6024 (VSBW	7D8A	2E00	
7D18	6024		7D8C	131A	JEQ >7DC2
7D1A	0200	LI R0,>0300	7D8E	045D	B *R13
7D1C	0300		7D90	0200	LI R0,>0301
7D1E	0201	LI R1,>7FA8	7D92	0301	
7D20	7FA8		7D94	0420	BLWP @>602C (VSBR)
7D22	0202	LI R2,>0004	7D96	602C	
7D24	0004		7D98	0981	SRL R1,8
7D26	0420	BLWP @>6028 (VMBW	7D9A	0281	CI R1,>0008
7D28	6028		7D9C	0008	
7D2A	0200	LI R0,>0304	7D9E	1B01	JH >7DA2
7D2C	0304		7DA0	10F6	JMP >7D8E
7D2E	0201	LI R1,>7FAC	7DA2	0601	DEC R1
7D30	7FAC		7DA4	100A	JMP >7DBA
7D32	0202	LI R2,>0009	7DA6	0200	LI R0,>0301
7D34	0009		7DA8	0301	
7D36	0420	BLWP @>6028 (VMBW	7DAA	0420	BLWP @>602C (VSBR)
7D38	6028		7DAC	602C	
7D3A	0200	LI R0,>FF00	7D42	06C0	SWPB R0
7D3C	FF00		7D44	D800	MOVB R0,@>8321
7D3E	D800	MOVB R0,@>8323	7D46	8321	
7D40	8323		7D48	D800	MOVB R0,@>8322
			7D4A	8322	



7DAE	0981	SRL R1,8	7E24	0766	
7DB0	0281	CI R1,>00F0	7E26	0420	BLWP @>6034 (VWTR)
7DB2	00F0		7E28	6034	
7DB4	1A01	JL >7DB8	7E2A	0204	LI R4,>7F84
7DB6	10EB	JMP >7D8E	7E2C	7F84	
7DB8	0581	INC R1	7E2E	0205	LI R5,>0002
7DBA	06C1	SWPB R1	7E30	0002	
7DBC	0420	BLWP @>6024 (VSBW)	7E32	D834	MOVB *R4+,@>8400
7DBE	6024		7E34	8400	
7DC0	10E6	JMP >7D8E	7E36	0605	DEC R5
7DC2	D020	MOVB @>8321,R0	7E38	16FC	JNE >7E32
7DC4	8321		7E3A	0200	LI R0,>0400
7DC6	1301	JEQ >7DCA	7E3C	0400	
7DC8	10E2	JMP >7D8E	7E3E	0600	DEC R0
7DCA	0200	LI R0,>0300	7E40	16FE	JNE >7E3E
7DCC	0300		7E42	D814	MOVB *R4,@>8400
7DCE	0201	LI R1,>8306	7E44	8400	
7DD0	8306		7E46	D800	MOVB R0,@>8321
7DD2	0202	LI R2,>0002	7E48	8321	
7DD4	0002		7E4A	0200	LI R0,>0711
7DD6	0420	BLWP @>6030 (VMBR)	7E4C	0711	
7DD8	6030		7E4E	0420	BLWP @>6034 (VWTR)
7DDA	8C30	C *R0+,*R0+	7E50	6034	
7DDC	0420	BLWP @>6028 (VMBW)	7E52	0200	LI R0,>0100
7DDE	6028		7E54	0100	
7DE0	D800	MOVB R0,@>8321	7E56	B800	AB R0,@>8320
7DE2	8321		7E58	8320	
7DE4	10ED	JMP >7DC0	7E5A	0200	LI R0,>0A00
7DE6	C38B	MOV R11,R14	7E5C	0A00	
7DE8	D020	MOVB @>8321,R0	7E5E	9020	CB @>8320,R0
7DEA	8321		7E60	8320	
7DEC	1601	JNE >7DF0	7E62	1A03	JL >7E6A
7DEE	045E	B *R14	7E64	0201	LI R1,>7FC0
7DF0	0200	LI R0,>0304	7E66	7FC0	
7DF2	0304		7E68	100A	JMP >7E7E
7DF4	0420	BLWP @>602C (VSBR)	7E6A	D060	MOVB @>8320,R1
7DF6	602C		7E6C	8320	
7DF8	0981	SRL R1,8	7E6E	0221	AI R1,>3000
7DFA	0281	CI R1,>0010	7E70	3000	
7DFC	0010		7E72	0200	LI R0,>0010
7DFE	1B07	JH >7E0E	7E74	0010	
7E00	D801	MOVB R1,@>8321	7E76	0420	BLWP @>6024 (VSBW)
7E02	8321		7E78	6024	
7E04	0201	LI R1,>C000	7E7A	0460	B @>7D2A
7E06	C000		7E7C	7D2A	
7E08	0420	BLWP @>6024 (VSBW)	7E7E	0200	LI R0,>018B
7E0A	6024		7E80	018B	
7E0C	10F0	JMP >7DEE	7E82	0202	LI R2,>000A
7E0E	0601	DEC R1	7E84	000A	
7E10	0A81	SLA R1,8	7E86	0420	BLWP @>6028 (VMBW)
7E12	0420	BLWP @>6024 (VSBW)	7E88	6028	
7E14	6024		7E8A	0420	BLWP @>6020 (KSCAN)
7E16	06A0	BL @>7F3E	7E8C	6020	
7E18	7F3E		7E8E	0204	LI R4,>FF00
7E1A	0304	DATA >0304,>0308	7E90	FF00	
7E1C	0308		7E92	9120	CB @>8375,R4
7E1E	C0C3	MOV R3,R3	7E94	8375	
7E20	13E6	JEQ >7DEE	7E96	16F9	JNE >7E8A
7E22	0200	LI R0,>0766	7E98	0420	BLWP @>6020 (KSCAN)



7E9A	6020		7F10	0580	INC R0
7E9C	9120	CB @>8375,R4	7F12	0420	BLWP @>602C (VSBR)
7E9E	8375		7F14	602C	
7EA0	13FB	JEQ >7E98	7F16	0981	SRL R1,8
7EA2	0201	LI R1,>7FCA	7F18	0281	CI R1,>0082
7EA4	7FCA		7F1A	0082	
7EA6	0420	BLWP @>6028 (VMBW)	7F1C	1302	JEQ >7F22
7EA8	6028		7F1E	0601	DEC R1
7EAA	0460	B @>7D0A	7F20	1001	JMP >7F24
7EAC	7D0A		7F22	0581	INC R1
7EAE	C3CB	MOV R11,R15	7F24	06C1	SWPB R1
7EB0	D020	MOVB @>8322,R0	7F26	0420	BLWP @>6024 (VSBW)
7EB2	8322		7F28	6024	
7EB4	1305	JEQ >7EC0	7F2A	06A0	BL @>7F3E
7EB6	0200	LI R0,>0100	7F2C	7F3E	
7EB8	0100		7F2E	0300	DATA >0300,>0308
7EBA	7800	SB R0,@>8322	7F30	0308	
7EBC	8322		7F32	C0C3	MOV R3,R3
7EBE	045F	B *R15	7F34	13C4	JEQ >7EBE
7EC0	D820	MOVB @>8324,@>8322	7F36	0201	LI R1,>7FB6
7EC2	8324		7F38	7FB6	
7EC4	8322		7F3A	0460	B @>7E7E
7EC6	0200	LI R0,>0309	7F3C	7E7E	
7EC8	0309		7F3E	C03B	MOV *R11+,R0
7ECA	0420	BLWP @>602C (VSBR)	7F40	C2BB	MOV *R11+,R10
7ECC	602C		7F42	0201	LI R1,>830A
7ECE	0981	SRL R1,8	7F44	830A	
7ED0	D160	MOVB @>8323,R5	7F46	0202	LI R2,>0002
7ED2	8323		7F48	0002	
7ED4	1106	JLT >7EE2	7F4A	0420	BLWP @>6030 (VMBR)
7ED6	0281	CI R1,>00F0	7F4C	6030	
7ED8	00F0		7F4E	C00A	MOV R10,R0
7EDA	1A12	JL >7F00	7F50	0201	LI R1,>830E
7EDC	0203	LI R3,>FFFF	7F52	830E	
7EDE	FFFF		7F54	0420	BLWP @>6030 (VMBR)
7EE0	1005	JMP >7EEC	7F56	6030	
7EE2	0281	CI R1,>0008	7F58	C185	MOV R5,R6
7EE4	0008		7F5A	0985	SRL R5,8
7EE6	1B0C	JH >7F00	7F5C	0246	ANDI R6,>00FF
7EE8	0203	LI R3,>0001	7F5E	00FF	
7EEA	0001		7F60	C207	MOV R7,R8
7EEC	0A83	SLA R3,8	7F62	0987	SRL R7,8
7EEE	D803	MOVB R3,@>8323	7F64	0248	ANDI R8,>00FF
7EF0	8323		7F66	00FF	
7EF2	0600	DEC R0	7F68	61C5	S R5,R7
7EF4	0420	BLWP @>602C (VSBR)	7F6A	6206	S R6,R8
7EF6	602C		7F6C	0747	ABS R7
7EF8	0221	AI R1,>0800	7F6E	0748	ABS R8
7EFA	0800		7F70	0287	CI R7,>0004
7EFC	0420	BLWP @>6024 (VSBW)	7F72	0004	
7EFE	6024		7F74	1B05	JH >7F80
7F00	0200	LI R0,>0309	7F76	0288	CI R8,>0004
7F02	0309		7F78	0004	
7F04	0420	BLWP @>602C (VSBR)	7F7A	1B02	JH >7F80
7F06	602C		7F7C	0703	SETO R3
7F08	B060	AB @>8323,R1	7F7E	1001	JMP >7F82
7F0A	8323		7F80	04C3	CLR R3
7F0C	0420	BLWP @>6024 (VSBW)	7F82	045B	B *R11
7F0E	6024		7F84	F0E2	DATA >F0E2,>FF00

(continued on page 35)



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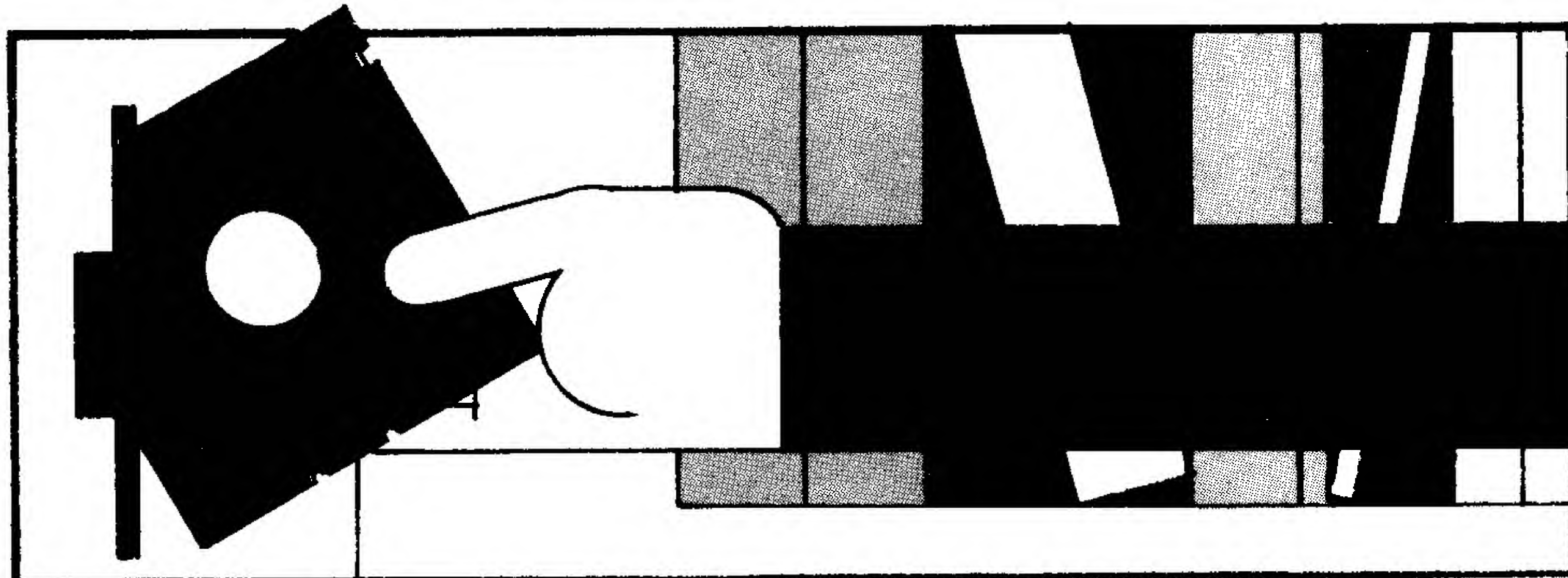


# LIBRARY CORNER

## WHERE'S THE CATALOG?!

By Tracy Caine  
IUG Librarian

By the time this magazine reaches you, the International 99/4 Users-Group's new Owner Written and Translated Software Catalog should be in your hands. We are very proud of the new catalog, especially after the delay in getting it out to you. We added approximately 600 new programs to the library, and have "boo-coup" updated versions of old programs. Our thanks to the thousands of members who participate in our Program Exchange. Without your support and many hundreds of hours of hard work,



the Software Exchange Library simply would not exist.

Our catalog was redesigned for maximum use with minimum effort. Gone is the old chart at the back requiring tedious cross-checking to make sure a particular program will RUN on your system configuration. All you need to know about each program in the new catalog is printed right there next to the name! We have tested each program at length to make sure all required hardware is listed; however, sometimes the printer errs and leaves off some important notations. As always, we are happy to exchange a program that will not RUN on your system because of a catalog printing error.

A note to new Users-Group members (and some older members, too). I'm always glad to answer questions and provide what technical assistance I can. If you have difficulties loading programs from the Library PLEASE check the User Instructions in the catalog; this may save you an enormous amount of time, not to mention the monetary contributions to AT&T!

I receive literally hundreds of calls each week from people who, for example, cannot

load a program from cassette because they have not checked or adjusted the volume and tone levels on their program recorders. I'm very glad to provide assistance, but to save both of us time, follow the old adage... "when all else fails, read the instructions!"

If, after repeated attempts to load the program, you are still not having any luck, please feel free to call or write. Remember, your problems may not always result from defects in your program or equipment. All magnetic media is checked before it leaves our office to make sure the information has been copied successfully and correctly. The mailer is stamped DO NOT X-RAY. Our reliable postal service, however, must not always read the packages, as cassettes and disks sometimes arrive at your home either partially or totally erased, or the information is so garbled it will not work at all. We will, of course, replace these at no charge.

Another frequent problem our members experience is the inability to load a tape-based program when the peripheral expansion box is turned on. The tape stops almost immediately with a Data Error just after the tone is heard. The first data information on the tape states the size of the program; if the program is larger than the memory space left in the computer, it will not load at all.

There are several solutions to this problem. One is to cut the program "in half," save each half separately on tape, then transfer these halves to disk with Extended BASIC using the Merge command. (Refer to the Extended BASIC manual for more information on the Merge command.)

The other solution to this problem, and by far the most simple, is to remember to turn the expansion box OFF when loading that particular program!

Speaking of Extended BASIC, there are no more of these cartridges to be sold. Texas Instruments evidently does not plan to continue to produce this title or make the source

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code available to a third party producer for further production and distribution. We apologize to the hundreds of thousands of 99/4A owners who will not be able to take advantage of this expanded and enhanced version of TI BASIC. We have done everything we can to try and convince TI that this module should continue to be in production, but to no avail.

Back to our new catalog. We are currently planning to publish quarterly updates; we have tried to do this in the past but have not been successful. We are receiving so many new programs from our members that we are already at work on this first update. Look for it in July! And keep those programs rolling in. We love to see the creative efforts of our members. I am constantly surprised that so many people are using this supposedly out-of-date computer.

When submitting programs to the Exchange Library, please allow about a month to hear back from the Users-Group. With the large number of programs we review, it takes a while to do justice to each and every program submitted.

I would like to mention something about the programs in the Library. Some programs are very elementary and are meant solely for enjoyment, or perhaps as an aid in basic programming techniques. Other programs are more professionally done and may be of the type you might find for sale in a retail outlet. While we realize that each member cannot hope to apply every program in the catalog to his personal use, we feel the catalog provides a wide range of interests for our entire membership. Of course, all programs are valuable to us because they're the products of your imagination!!

As I stated before, I'm happy to answer your individual technical questions. Future Library Corner articles will contain information concerning useful applications you may use to get the most from your Home Computer.

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## RECORD KEEPING

One of the most useful functions of your Home Computer is its ability to assist you in record keeping. Before I purchased my first Home Computer, family and business record keeping was a real chore. Medical records were kept in a shoe box in a kitchen cabinet, business and travel records were stuffed in a file folder in my office, cancelled checks could be found in the dresser drawer, and so on, and so on. . . .

Record keeping now, however, is very different. With a few simple keystrokes, I can tell you how much money it took to operate our swimming pool last summer, how much interest I paid on my home mortgage, what my average golf score is and a multitude of other facts.

All it takes is the right program and the discipline to enter figures into your computer to become an expert record keeper.

There are numerous programs available for record keeping using the TI Home Computer. Some are quite simple while others require additional peripheral equipment and can become extremely intense. Listed below are several programs or products you may wish

to consider in helping you and your family become more proficient in record keeping.

The first record keeping programs we will address are the simplest. They use data statements either at the beginning or the end of the program and require no additional peripheral equipment beyond the Home Computer itself.

### Software Exchange Library Program 7076 — Household Inventory

I guess I never realized how important a program of this nature could be until a little over a year ago I received a letter from one of our members whose home had been burglarized. Over 20 different household items had been taken, including his Home Computer. The letter stated that insurance proceeds were expedited due to the fact that each stolen item was listed by make, purchase date, cost and serial number, utilizing this program.

### Library Program 5450 — Med-Expense

This program takes a little more programming effort due to the fact that the data statements are embedded in several places in the program. It is, however, very useful and tracks three categories of medical expenses: doctor's services, prescriptions and medical supplies.

### Library Program 5481 — Expense Account

A great program for the outside salesman. Input weekly expenses in each of 14 categories and the program totals your expenses both daily and weekly for you. You can also get a quick calculation of miles driven and amount of reimbursement due.

### Library Program 7011 — Eats

Having a tough time deciding where to dine out this week? This little program

can help. Using data statements, you can scan your favorite dining places by price, location or entree. A very useful program to check before entertaining friends or business clients. The program is easily changed to enter your own data.

### Library Program 7035 — TV Schedule

"Where is the TV Guide?" This question was asked daily at our house until this program arrived. Now we're able to program in selections that we wish to watch and run a search either by title or date.

### Library Program 7049 — Cookie File II

Very useful for the gourmet of the house, this program checks ingredients on hand and tells what type of cookies can be prepared from the ingredients list. It can also be altered to perform many other menu-planning chores.

The next category of programs uses cassette data files and will require the use of a cassette recorder and blank data tape. This is a convenient method of permanent record storage.

### Library Program 8113 — Video Tape Library

Although designed for storing records of a video tape library, this data base program can easily be adapted to store records on stamps, coins, phonograph records, books or a host of other items.

### Library Program 8033 — Journal

This program provides a ten-page journal to store important information. There is no set structure as to the information that can be filed and you can search for your information either by date or page number. This program requires the use of the Extended BASIC command module.

## ATTENTION PROGRAMMERS!!

With TI's decision to exit from the Home Computer market, many of the normal channels of distribution for software products will soon disappear. The need for good quality software products for the TI 99/4A Home Computer, however, will continue to be strong due to its large consumer base of over 2 million machines.

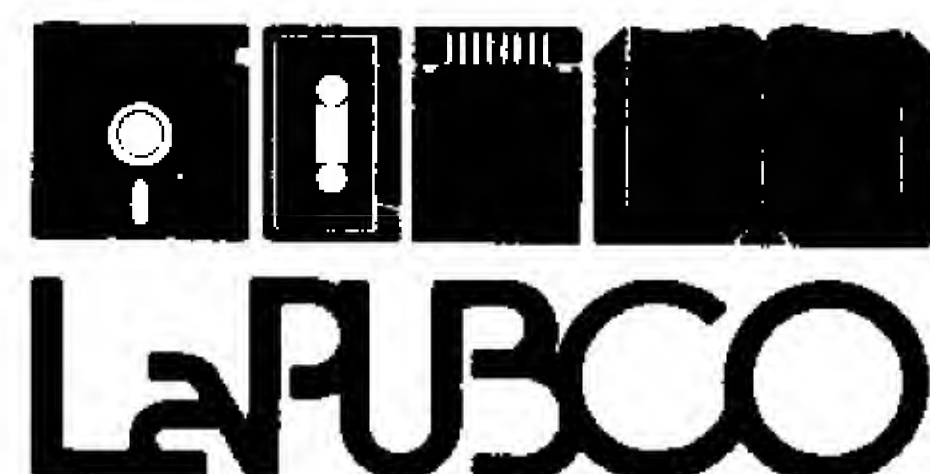
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### FOR THE TI 99/4A GUARDIAN \$29.95

Copyright 1983 Kevin Crowder

GUARDIAN is a fast paced, one or two player game which pits you against an army of evil robots intent on capturing your city. By stealing all of the energy pods providing food, comfort and entertainment, this swarm of intelligent machines will gain full control. When two play, it's just like the real world of politics! Each player can treat the other like an ally until he can be zapped without losing control to the robots on the field of play!

Requires TI 99/4A, 32K Memory Expansion, Disk Memory System and Editor Assembler cartridge

### TE-1200\* - \$49.95

Available April - Get your order in EARLY!!

300 or 1200 baud terminal emulation. TE-II file transfer plus on-line spooling to disk. No more having to stop and dump to disk by screen!

Requires TI 99/4A, 32K Memory Expansion, Disk Memory System, RS 232, and Editor Assembler cartridge



THIS DISK BASED EMULATOR IS AN ABSOLUTE MUST FOR THE SERIOUS TELECOMPUTING USER

\*TE-1200 Does not facilitate speech or graphics

### FOR THE TI PC EDUCATIONAL GAMES - \$9.95 each (on disk)

#### NAME THAT STATE OR CAPITOL

Good game for grades 4, 5 and 6

#### CAPITOLS OF EUROPE

Great help for grades 3 through 7

#### LOANS

Loan amortization program - simple but useful!!

#### PERT/SCHEDULER

Simple network analysis program. Identifies critical path/prints report!

Softmail, Incorporated  
P.O. Box 745  
Rockwall, TX 75087



## Library Program 7080 — List II

A clear, easy-to-use mini data base which can be used to store and retrieve all types of information. It will create up to 100 screens of 20 lines of data to be safely filed away. Several editing functions allow easy data manipulation.

## Library Program 7061 — Dateminder

A cassette-based program designed for helping you remember the dates of special occasions. It is menu-driven and will hold 50 separate occasions. The program allows you to save, read, add, scan or delete data from your cassette files. It is smart enough not to lock up if you have not loaded or added data before trying to delete or scan. Dateminder is very versatile and can easily be used for much more than storing birthdays.

## PHM 3013 Personal Record Keeping Command Module

One of the most useful tools for keeping records on your TI Home Computer. Personal Record Keeping offers a variety of additional functions not found in most cassette and disk based programs. It allows you to organize, update, display, analyze and evaluate your facts and figures with great ease. A special math transformation mode is very useful if number crunching is required in your data input.

The next set of programs for record keeping with your TI 99/4A Home Computer are more sophisticated in nature and require additional peripheral equipment, including a disk system and Extended BASIC command module.

## Master Series 99 DataBase 300

An extremely flexible data base program designed for up to 300 records. Each record can consist of eight screen lines of data divided into 16 distinct fields. Data Base 300 offers data entry, update, display, scan and printout features. A 32K memory expansion and printer are required.

## Library Program 7078 — Household Accounts

Store, recall and revise household accounts divided into 46 categories for a full 12 months with this program. All accounts are automatically totaled for review in a compacted category format. This program will require the use of an optional printer.

## Library Program 7025 — Family Tree II

For those interested in genealogy, this program is a must. It is menu-driven and easy to operate. Using this program, you can keep track of your ancestors' names, birthdates, birthplaces and useful information. Additional peripheral requirements include the 32K memory expansion.

As you can see, there are many useful record keeping functions that your TI Home Computer can perform. All it takes is your willingness to make your computer perform for you.

## MISCELLANEOUS USES

In preparing this article, I wanted to give examples of programs we actually use with some degree of frequency in our own home. Not having the time I would like to program myself, many of the programs we use are from third party sources or from the IUG's Software Exchange Library. Although some of the programs we use may not be applicable to all of our members, many, I hope, will be useful for you and your family.

## Library Program 7071 — Utility Bill Analysis

It would seem that my children only know one direction of the electrical light switch (ON). Our electric usage was getting out of hand! Now, by using this program and allowing my children to assist in data input, we are on the road to energy conservation.

## Library Program 7050 — The Grocery List

Yes, we use this program! Yes, it does save us money! We now buy only the items that are listed on the printout. There is also a convenient place for comments or coupon indications on the listing. A printer is required to use this program.

(continued on page 36)

# SALE

## ALL X-BASIC PROGRAMS \$9.95 / CASSETTE

### INTRO TO PRE-SCHOOL LEARNING Press any key for response

### PRE-SCHOOL 1 Press correct key for response

(Both Pre-School Programs teach: the Alphabet, Numbers, Shapes, & Body Parts)

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### TAG RUNNER - 2 player game/joysticks required. Game of tag in Magical Garden

### BURGER HUNT - 1 or 2 player game Exciting hunt for Space Burgers

### UTILITY - (Disk also (\$12.95)) Speech 1. Screenshot, Hex-decimal Conversion, Sprite Generator

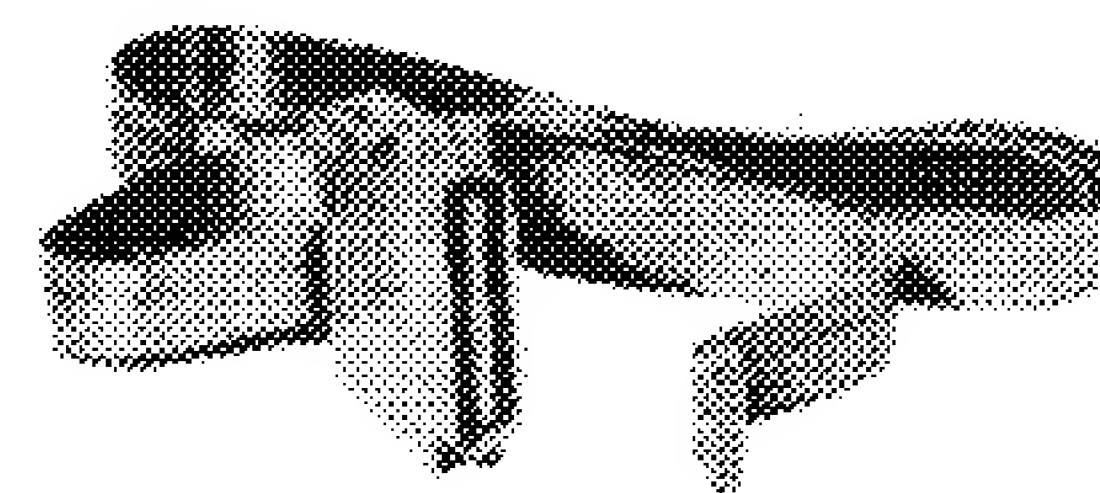
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# CABLES for the TI-99/4A



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We guarantee these superbly crafted, high quality interface cables to function correctly with the appropriate printer! Simply plug one end into the 16 pin parallel connector on your RS-232 Interface Card and the other end to the 36 pin "Centronics" type connector on your printer. All contacts are gold plated. Standard length is five feet.

**Standard Parallel Cable** - For the following printers with parallel inputs: EPSON, STAR-MICRONICS, TI, PROWRITER, GORILLA, MANNESMAN TALLY, SMITH-CORONA TP II, and many more.  
10021 \$24.95  
22243 (ten foot length) \$34.95

**OKIDATA/Parallel Cable** - Contains interface electronics within the connector housing required to adapt any Okidata parallel printer to the TI 99/4A.  
10036 \$37.95

**SMITH-CORONA TP-I cable** - Contains interface electronics required to adapt the 99/4A to parallel TP-I printers.  
10040 \$37.95

**AMDEK Plotter Cable** - The only interface cable we know of that allows the 99/4A to drive the popular Amdek plotter.  
22102 \$44.95

**TI PROFESSIONAL COMPUTER cable** - Connects the 25 pin/parallel output of the Professional to a 36 pin parallel printer output.  
13009 \$37.95

**RS-232 CABLE** - Connects the 25 pin female serial port on the RS-232 Interface Card to any RS-232 standard device. Standard cable length is five feet. 25 conductors, terminated with 25 pin, male "D" connectors.  
10055 \$24.95

**"Y" CABLE** - Allows use of both (2) serial ports available from the serial connector on your RS-232 Card. The cable has one 25 pin male connector to attach to the RS-232 Card and two 25 pin female connectors to attach to two serial peripherals.  
10069 \$49.95



## CASSETTE ADAPTER

Your cassette recorder doesn't operate on the remote from your 99/4A? Probably the polarity is wrong. Simply plug our attractive adapter into your recorder's remote jack, and then plug in your cassette cable. It's a lot cheaper than a new cassette recorder!  
10074 \$4.95

**CASSETTE CABLE-DOUBLE** - Yes, we have them. Connect up to two recorders for handy program and data reading and storage. Requires three inputs for microphone, external speaker, and remote control.  
21186 \$13.95

**PERIPHERAL EXTENSION CABLE** One end of this highly flexible 30 inch cable plugs into the peripheral expansion port on the right side of the 99/4A console; the other end connects to the 44 contact slot of a stand-alone peripheral (speech synthesizer, stand-alone memory expansion, etc.). Allows convenient placement.  
22633 \$24.95

**PERIPHERAL EXPANDER CABLE** Similar to above, but with two peripheral connectors on one cable. Allows attachment of up to two separate peripheral branches.  
22647 \$32.95

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# MULTICOM'S COM-ADAPTER

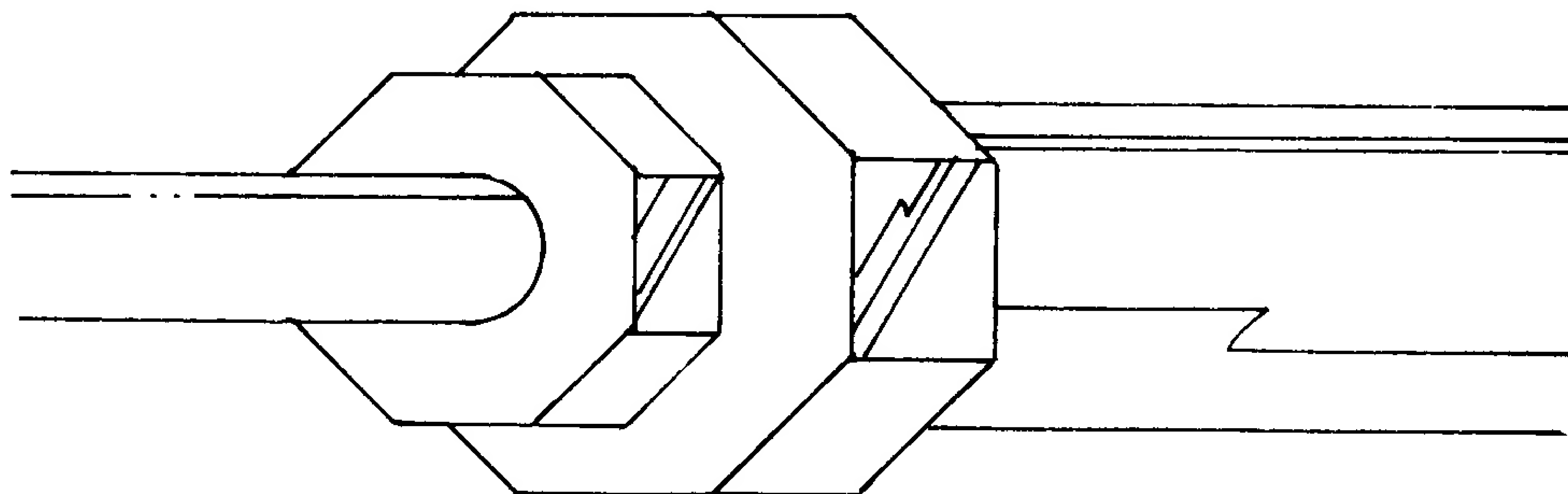
By Tracy Caine  
Technical Assistant

We recently tested a new product from those long-time supporters of the TI 99/4A, Multicom/Intellitec (previously known as Intellitec Computer System). Their newest product is a stand-alone RS232 Interface called the Com-adapter.

It works without the need for the Peripheral Expansion box, and plugs into the right hand side of your 99/4A in the same slot used for the Speech Synthesizer (yes, it will work plugged into the SS). It will also work in conjunction with Multicom's stand-alone 32K Memory Expansion.

In addition, you can plug Percom's stand-alone disk drive into the other side of the Com-adapter and "daisy-chain" all these peripherals.

The Com-adapter has its own power supply and requires a 110V outlet. There are two ports on the back of the unit, labeled RS232 and Parallel. Shout praises, everyone, it is a true Centronics parallel port. Thank



goodness there are those showing some compassion for owners of the 99/4 and 99/4A.

The interface is accessed somewhat differently than TI's RS232 interface. It uses the TI BASIC commands SIO and SIO/1 for the serial port, and LP and LP/1 to reference the parallel port. If jumpered properly, you can also connect two Com-adapters to the console. If this is done, the second serial port is referenced by SIO/2 and second parallel port by LP/2.

The Com-adapter is shipped with a complete users manual which describes the commands needed to access the two ports of the adapter. In addition, it also lists pin configurations and cross references them to both serial and parallel printers. There is a test section of the manual to allow complete checks of the printer's capability.

I tested the parallel port of the adapter by using my trusty Epson Mx-80. I use this printer daily for normal correspondence and tests of Software Exchange Library programs. Normally, it's connected to the RS232 card in my PEB via the serial port, but I pulled the serial card for this test. Multicom was kind enough to send us a 12' parallel cable, so I

did not have to order a new cable. Our tests were run using not only the tests built into the Com-adapter, but also with output from programs from the Library, the Master 99 Series, TI-Writer, and the Companion word processor. All functions of the printer worked beautifully.

The serial test was completed using an MPI Printmate 99. I was unable to use my Epson with the serial board installed as it is configured with DA=8 as an open command. The Com-adapter does not recognize the DA switch option. Besides, I wanted to give the Printmate a thorough testing, too. I again used programs from several sources, and again, everything worked as planned.

At \$150, the Multicom Com-adapter is an excellent way to avoid the purchase of the Peripheral Expansion System just to use a printer or to interface your computer via a modem to some other computer system.

For further information or to order a Com-adapter, contact Multicom/Intellitec, P.O. Box 1693, Sandy, UT 84091, or call (801) 572-6272.

## MULTICOM

### RS 232 For TI 99 4 A

Com Adapter includes RS232 and parallel printer port, attaches to the right of the console and also allows the use of other peripherals including the peripheral expansion box

**Price** ..... **\$144.95**

### 32K Memory Expansion Model 1000

32K Memory Expansion Card

For use in the TI Expansion Box

**Price** ..... **\$99.00**

### MODEL 2000

#### 32K Memory Add On

- This model attaches to the right of the console and also allows the use of other peripherals including the peripheral expansion box.

**Price** ..... **\$124.95**

### Combo Unit

- RS 32 port and parallel printer port, plus 32 K Memory Expansion in one compact unit.

**Price** ..... **\$259.95**

- TI99 4/A compatible
- 6 month warranty
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Sandy, Utah 84091

or Phone:  
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## I want Enthusiast'99 also.

Please send me information on how I can plug into your network of computer owners as a member of the International 99/4 Users-Group.

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P.O. Box 67/  
Bethany OK 73008**

**International  
99/4  
Users-Group**





# NEW MASTER 99 RELEASES

(continued from page 15)

**Tafara by Paul Pichette**

**M9-270 Cassette for Mini-Memory**

**M9-271 Disk for Editor/Assembler**

(Extended BASIC version not yet available)

The third addition to the Master 99 Series, Tafara, is also a fast-paced, one-player game that is fun for the entire family.

The object of the game is to fire bolts from a crossbow to destroy the Tafara eggs. The crossbow, controlled by either the arrow keys or joystick, can move horizontally across the entire screen, but is limited somewhat in its vertical movement. The game starts with a chain of 12 Tafara eggs at the top of the screen. One by one, the eggs roll down the screen, bouncing off shells randomly spaced on the screen. If a bolt hits an egg it instantly becomes a shell and breaks the chain.

Any egg which reaches the bottom of the screen will vanish and reappear at the

top. This causes a complete Tafara snake to be born. Once all the eggs are turned to shells, the Tafara snakes born during that round will appear one at a time. Their behavior is the same as that of the eggs, except for one slight change; for each snake that reaches the bottom of the screen, 1000 points is deducted from your score!

A crossbow is lost by touching an egg, snake, gargoyle or chain or if the score drops below zero. The game ends when all crossbows are gone. Scoring is as follows: shooting an egg, 100; shooting a snake, 100; destroying a shell, 12; spearing a gargoyle, 300, 600 or 900 points, depending on its distance from the crossbow; and when a snake reaches the bottom of the screen, -1000.

Tafara requires extremely quick hand/eye coordination and is a welcome addition to the Master 99 Series. For

further information on programs in the Master 99 Series, refer to your Software Exchange Library Catalog or contact the IUG.



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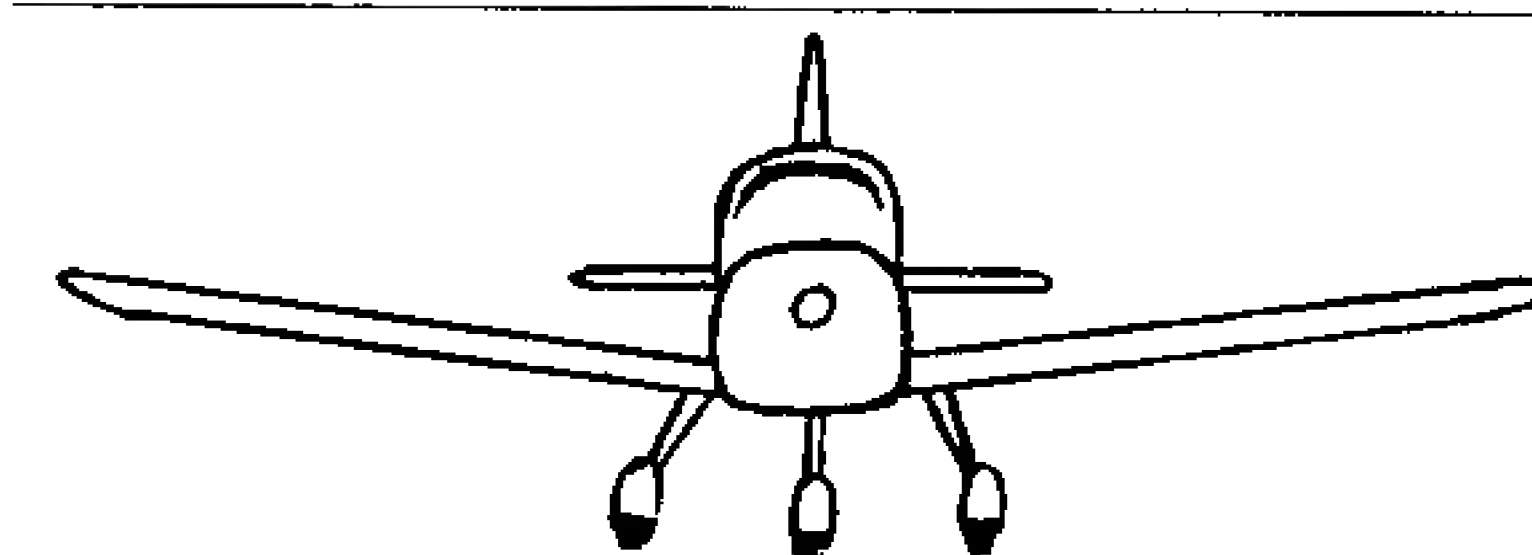
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## SPACE INVADERS — MINI MEMORY

(continued from page 28)

7F86	FF00	
7F88	1818	DATA >1818,>1818,>3C7E,>7E3C
7F8A	1818	
7F8C	3C7E	
7F8E	7E3C	
7F90	0010	DATA >0010,>0810,>0810,>0800
7F92	0810	
7F94	0810	
7F96	0800	
7F98	423C	DATA >423C,>5A3C,>2424,>2400
7F9A	5A3C	
7F9C	2424	
7F9E	2400	
7FA0	243C	DATA >243C,>5A3C,>2442,>8100
7FA2	5A3C	
7FA4	2442	
7FA6	8100	
7FA8	A080	DATA >A080,>8004,>C080,>810F
7FAA	8004	
7FAC	C080	
7FAE	810F	
7FB0	1080	DATA >1080,>8207,>D000
7FB2	8207	
7FB4	D000	
7FB6	47	TEXT 'GAME OVER'
7FC0	59	TEXT 'YOU WIN!!!'
7FCA	20	TEXT ' '
		END



### FLIGHT SIMULATOR

Learn to fly with the Dow-4 Gazelle, a realistic IFR simulation of a typical 4-place private plane. It is not a game. A manual with 30 pages of text plus 7 figures helps the novice learn to fly. Experienced pilots will enjoy flying the ILS approach. Response time under 1 sec average. Display shows full panel (10 dials and 11 lights) and indicates position of runway for landing. Realistic sound effects. See reviews in Jan 83 99'er and Jun 83 AOPA Pilot. Requires joystick. Cassette. \$30.

### EDITOR/ASSEMBLER

The Dow E/A turns your TI into an assembly language machine. For use with TI's Mini Memory Module. Fast and convenient. Allows use of entire RAM. Manual includes sample program with detailed explanations. See review in Aug 83 99'er. Cassette. \$25.

### ASSEMBLY LANGUAGE PRIMER

Teaches TI assembly language in step by step fashion for Basic programmers. Explains concepts in detail with many examples. This is what you have been waiting for if you haven't been able to understand the TI Editor/Assembler manual. \$20

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For additional information, write or call 412-521-9385. To order, send check or MO U.S. funds:

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## High Quality Software for the TI99/4A

**Citadel** - Enter into the Dungeon of Horrors, where every game is never the same. Contains 50+ monsters, demons, and humanoids ready to kill. Find treasure and powerful magic to fight through the randomly generated adventure.

**Extended Basic Required**

**Diskette Only** .....\$17.95

**Floating Point Dictionaries** -

Gives descriptions of available commands at a single keystroke. Excellent teaching aid.

**FPD Basic** .....\$14.95

**FPD DOS** .....\$ 4.95

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**Diskette Only for FPD Series.**

**Meteoroids** - Fast action game.

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## Programmers!!

Nebula is interested in marketing high quality software written by individual authors for the TI99/4A, IBM PCjr, Apple IIe, or C64. Send for Marketing Packet.

**Send for Free Catalog**

**NEBULA SOFTWARE**

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Niles, IL 60648-0915

**Library Program**

**5418 — Word Processing**

Although I use several of the higher-powered word processors designed for the 99/4A, other members of my family have mastered this simple program and use it for school work and notes to their friends and family. An ideal program for the beginning typist.

**Library Program**

**5442 — Decisions**

Before making any major purchasing decision when several products are being considered, I always use this program. It allows you to assign different weights to values of consideration before making that final purchase. I can honestly say that this program has saved me hundreds of dollars.

**Library Program**

**3226 — Fiddler on the Roof**

One of the most impressive ways to show off your computer when friends or family members drop in is to have some type of graphic display on its screen. I use this BASIC program which shows off both the graphic and musical capabilities of my home computer.

**Library Program**

**4417 — Biorhythms**

Although I'm not a big believer in this sort of thing, it's fun to check and see

what type of day, week or month I am supposed to have. My kids love it because it can tell how compatible they are with their friends or dates.

**PHM 3006**

**Home Financial Decisions**

There are several programs in the IUG Software Exchange Library which will perform many of the functions this module executes. Now, however, with its relatively low cost, Home Financial Decisions is a real bargain and a must for every 99/4A owner.

**PHM 3113**

**MicroSoft Multiplan**

One of the most versatile spreadsheet programs on the market today for this or any other computer, Multiplan can be adapted for many purposes. My 17-year old son currently uses it to track such interesting things as football scores, weightlifting goals, and his personal finances (and he has his own SECRET program for the girls he would like to go out with).

**Library Program**

**7075 — Poison Prevention**

I have to admit, I have never used this program in the way it was intended to be used, but if I ever need it, it's comforting to know it is there.

**Library Program**

**5488 — The Investor**

This is the most professional program in our library dealing with stock investments. Whether you are a large or small stock tycoon, this program will help you with your portfolio analysis. The Investor requires Extended BASIC, 32K expansion RAM, disk system and a printer.

## ENTERTAINMENT

Your TI 99/4A may be the tie that binds your family together this year! Oftentimes, "computer entertainment" is depicted as a zombie-like teenager saving the world from alien beings for the umpteenth time that day.

Entertainment utilizing your 99/4A, however, has much more to offer than merely wiping ne'er-do-wells from the face of the earth. Third party producers and the IUG's Software Exchange Library offer literally hundreds of excellent programs designed for the computer user from ages six to 60 and many are multiple player games. Following are some of the better entertainment programs available to the 99/4A owner-family... with a few excellent space action games included for good measure!

**CUBIT**

Simple in design, but oh, so challenging! A one or two player game, CUBIT is destined to be one of the most sought-after software titles in 1984. Much like Q-Bert, the graphics and movement in

# REAL MUSIC!

*Four channel, 12 voice music from your 99/4A!*

Software package allows you to create music using the

**FORTi  
music board**

Control pitch, duration, PLUS the ATTACK, SUSTAIN, DECAY, and RELEASE characteristics of each of the 12 voices.

Generates bass down to 32 CPS.

Send for two channel stereo cassette recording to see what your system COULD do!! \$3.00 shipping and handling charge for recording.

\$299.95

includes software  
(on disk)

and the FORTi synthesizer board  
for your expansion chassis.

Requires: TI 99/4A, 32K Memory Expansion, Disk Memory System, Peripheral Expansion system and your stereo. You may want a 4 to 2 channel mixer (\$24.95 at Radio Shack)

Send check or money order to:

**TEXAS PERIPHERALS, INC.**

624 SORITA CIRCLE WEST

HEATH, TEXAS 75087



this Assembly language-written game rival that of any arcade game and is hours of fun for the entire family. CUBIT is available on three versions; cassette for the Mini-Mem, Extended BASIC and Editor/Assembler. Order yours now from the IUG or through Artios Software, 3211 N.W. 26th, Oklahoma City, OK 73107.

#### DIABLO

A perfect remedy for an overcast day, or any day at all! Depending upon how well you plan your moves, Diablo could keep you at the console for literally hours. The object of the game is to keep a single ball rolling continuously on an intertwined track. The game begins with a full screen of track placed on 116 movable panels. You have one blank section with which to work. When you move your section up, the section you replace moves down, and so on. Just a few moves changes the entire makeup of the track, so you must use careful strategy. Too sophisticated for the little ones, but excellent for ages 10 and up. Diablo requires Extended BASIC and is available for \$19.95 from Extended Software Company, 11987 Cedar Creek Drive, Cincinnati, OH 45240 (513) 825-6645.

#### GUARDIAN

Just when you thought you had played them all, along comes Guardian! A one- or two-player game, each category consists of four levels of difficulty. The object is to protect the eight energy pods which provide food, comfort and entertainment to the earth's inhabitants. Evil forces bombard the pods from all sides, intent upon stealing the pods and gaining

control over the earth. The one player game is exciting enough, but the two player game involves much more strategy and must be played to be appreciated. This exciting space action game will keep the entire family happily occupied for hours on end!

Guardian requires the 32K memory expansion, disk memory system, and Editor/Assembler module, and is available for \$29.95 from Softmail, Inc., P.O. Box 745, Rockwall, TX 75087.

#### KING OF THE CASTLE

Where to run? where to hide? where to lay siege? or ambush? You have a multitude of choices with King of the Castle, a new 16-level action game by Cydex Software.

You are a Norman king in your castle. Under attack by viking invaders, you realize you are alone in the house, deserted by loyal(!) guards and servants. It seems as if you are destined to meet your doom . . . but wait! You have some tricks up your sleeve yet! Your knowledge of gunpowder and oriental weapons enables you to hurl stars and plant land mines throughout your castle, felling vikings at every turn.

Your castle consists of two floors, and the stairway at each of the four corners enables you to see what's transpiring below. A secret passageway at the center of the room transports you to the outside to plot and plan; but be quick — those vikings are sneaky, too! King of the Castle is available for \$17.95 in four versions, cassette or disk for Mini-Mem, and disk for Extended BASIC, or Editor/Assembler, from Cydex Software, P.O. Box 14771, Portland, OR 97214.

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#### D-STATION

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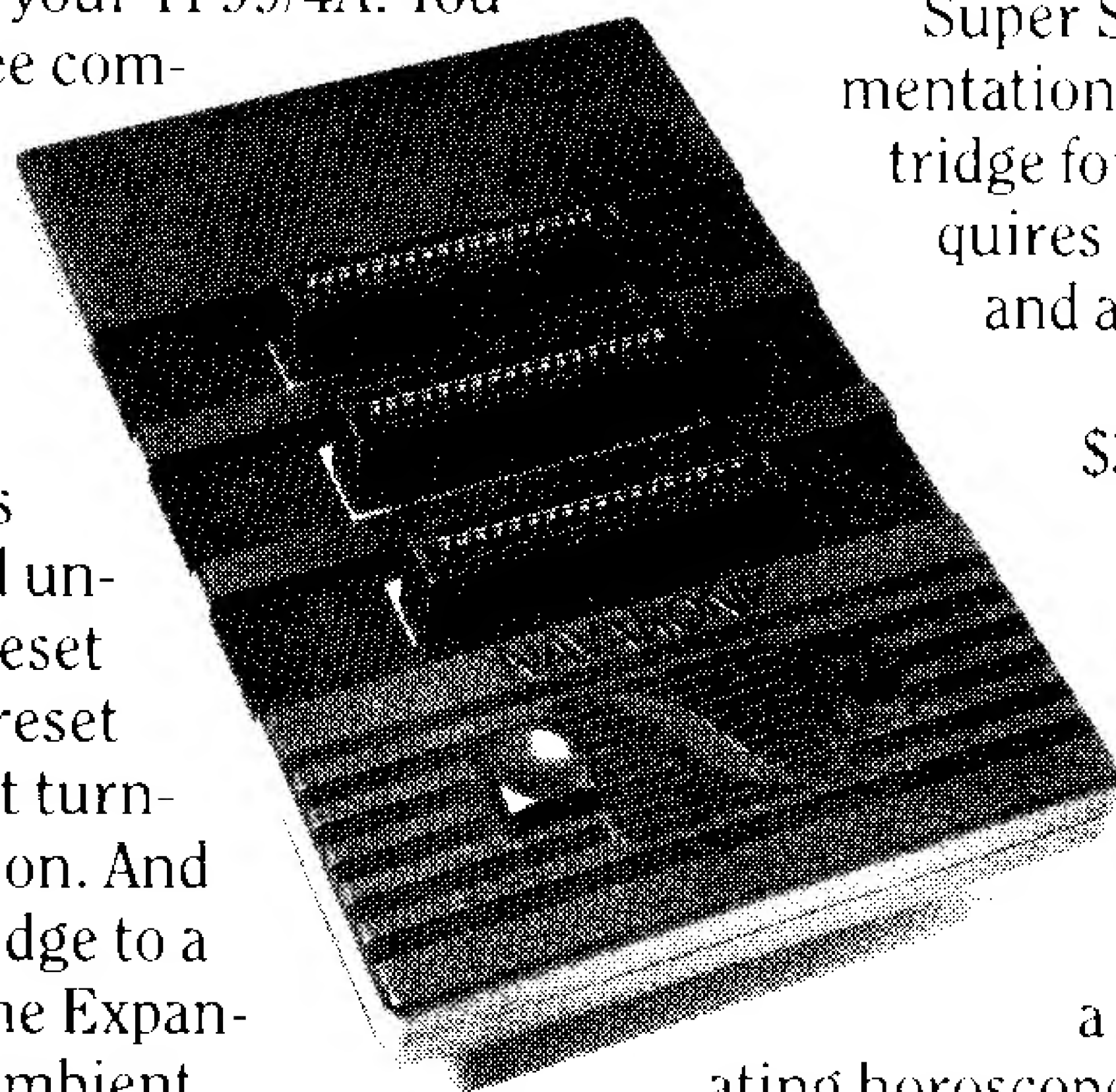
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# RETAILER'S SHOWCASE

## COMPUTER CORNER DETROIT, MICHIGAN



Based in Detroit, MI, Computer Corner is one of those rare retail stores: they specialize in Texas Instruments Home Computer products.

Born of his own personal frustration to find acceptance and support among local computer dealers, store owner Max Ettinger had a dream. As a TI user for some time, Max felt he could best support the TI with a small specialty store. Knowing the major competition in Detroit did not come from the local computer stores (which made Max feel, he says, as if he had the plague) but the mass merchandisers, he opened his first store in Oak Park, MI.

The first rule of thumb at Computer Corner is and always has been "the customer always comes first." Attempting to achieve what no other Detroit merchant had, Ettinger obtained all of the TI software titles and made them available to TI users. In addition to a full stock of available TI software at competitive prices, Computer Corner's solid commitment to the TI 99/4 and 99/4A owners enabled the store to outshine and outsell the mass merchandisers in the TI Home Computer market.

With the help of his brother Shaun, Ettinger opened his second retail store in Warren, MI, in June 1983. The opening in September of still another store in South Lyon, MI, accompanied the seasonal change. The Computer Corner in South Lyon is run by Ron Wilkes, a college computer programming instructor.

As was the entire world of TI 99/4 and 99/4A owners and users, Computer

Corner was taken by surprise at Texas Instruments' withdrawal from the Home Computer business at the beginning of the holiday season. Ettinger's entire organization not only felt orphaned, but was expected to soothe the ire and frustrations of its patrons as well.

At the first of November, all three Computer Corner stores saw its shelves picked clean of product within a few hours after opening the doors. For days, Ettinger said, the onslaught of people was tremendous.

"It just seemed as if we couldn't get enough product in fast enough to satisfy the hunger," he said.

When Ettinger realized the limits of his stores, an idea was spawned and he set his plan to action.

The day after Thanksgiving, the doors at the three Computer Corner stores were opened to what some believe to be the world's largest Texas Instruments' brand sale. In the previous few short weeks, Max and Shaun had assembled 30,000 square feet of TI 99/4A software and hardware. Staffed with dozens of product service representatives from Texas Instruments, the entire Computer Corner staff, special warehouse help, and third party vendors such as Star/Micronics, Extended Software, American Software Design and Distribution Company and others, the stores saw a customer flow of more than 2,000 per hour.

Successfully supplying tens of thousands of people with computers, expansion systems, recorders and software, Shaun Ettinger said, "never in all my years

of retail selling have I seen so many people wanting a closeout item."

What does the future hold for Computer Corner? Ettinger says he plans to continue the commitment to TI 99/4 and 99/4A owners, and proved his point on March 2 by opening a fourth store in Michigan, with Jim Schuneman joining the Computer Corner management team.

"Our efforts to find new and better products for the TI have increased dramatically in previous months," Max said. Computer Corner is now a direct source for the new CorComp products, the Axiom interface and printer, and several other new TI support products.

Today Computer Corner boasts having one of the largest inventories of TI products in the nation, ranging from the stand-alone disk drive controllers to expansion systems, Milton Bradley's MBX system, and new releases such as Buck Rogers and Congo Bongo. The firm operates a free, 24-hour TI BBS, (313) 544-7788, and publishes a free, multi-page newsletter, the "Cornerstone." To receive a free copy, send a self-addressed, stamped envelope to Cornerstone, 25900 Greenfield, Suite 132, Oak Park, MI 48237.

Computer Corner's mail order department is in full force, attempting to satisfy the hunger for TI products from such far-away places as Norway, Canada, and even California. Max Ettinger still has a dream. That dream is a Computer Corner in your town that specializes in products by Texas Instruments.

### INDEX TO ADVERTISERS

Axiom Corporation .....19  
Brois Software .....33  
Compro Systems .....15  
ComputerAge, Inc. ....30  
Databar Corporation .....7  
The Data Process .....20  
Design Strategies .....22  
Dhein's True Value .....1  
John T. Dow .....35  
Extended Software .....23

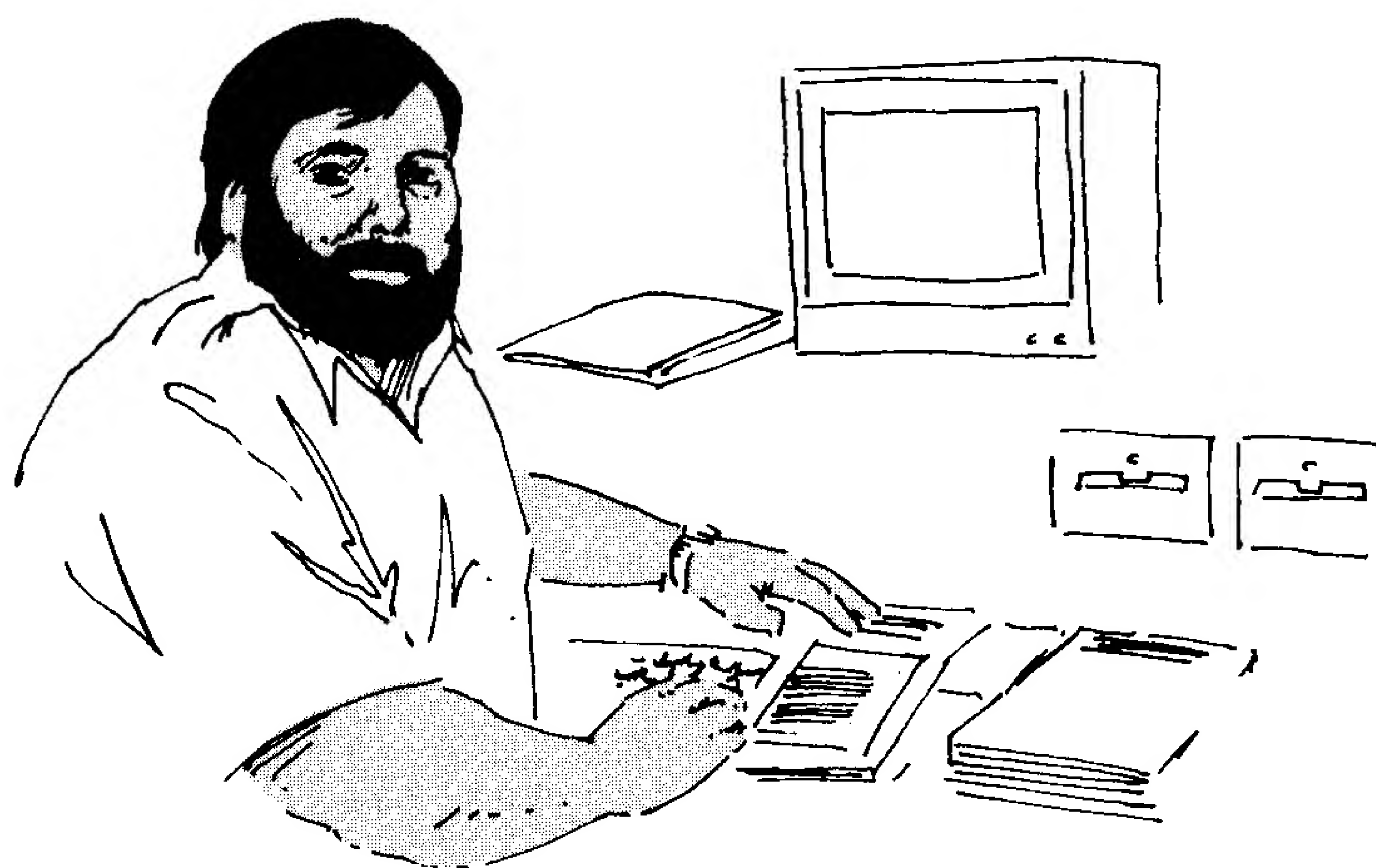
H.A.S. ....31  
Intelstar .....15  
Intelpro .....18  
IUG .....IF, 34, IB  
J & K H Software .....35  
Kean Computing .....12  
LaPUBCO .....32  
Micromagic Software .....37  
Morningstar Software .....29

D.S. Muenchau .....6  
Multicom, Inc. ....34  
Navarone Industries .....9, 38  
Nebula Software .....36  
Newport Controls .....31  
Norton Software .....16  
Otey Associates .....17  
RAL House .....18  
The Softies .....37

Softmail .....32  
SST Software .....24  
Systems Interface .....11  
Tachyon Systems .....13  
Tenex .....33, OB  
Texas Peripherals, Inc. ....36  
Tiger Electronics .....11  
Unisource Electronics .....5  
Wordware Publishing .....14  
Wycove Systems .....30



# CHARLIE'S PAGE



## THE RECOVERY PROCESS

By Charles La Fara

President, International 99/4 Users-Group

It's now been six months since Texas Instruments pulled the plug on its home computer division on October 28, 1983. Yet, unlike other consumer products that might have died an instant death, the TI Home Computer is only severely wounded and awaiting much-needed surgical assistance. How severe the wounds are and its chances of recovery depends on a volunteer unit charged with saving it from terminal extinction.

Not unlike the "runt of the litter," this Home Computer's parents are ignoring it and have all but kicked it out of its whelping box. Now the Home Computer's brothers and sisters can suckle at the mother's breast which seemed so full for the Home Computer and squirted cash to it for over three years. Is it really the Home Computer's fault it is in the shape it's in today or is it the neglectful parents who are to blame? At this point it doesn't seem to matter one way or the other, for the die has been cast and federal agencies have agreed that all life support must be cut off.

Who, oh who, will save this child? Unlike other of the world's orphans, we cannot count on agencies such as CARE, UNICEF, or the Catholic Relief Fund to step in. Would Boy George give a benefit concert to save it? Doubtful. Would its parents welcome it back as a prodigal son? Highly unlikely. TI's own Chairman of the Board, Mark Shepherd, told the 1984 shareholder's meeting in a tearful speech, "it is now time that Texas Instruments return to a more normal business environment."

The Texas Instruments Home Computer CAN be saved from total extinction, but it can only be saved by those who own one. We have already seen several third party sources decide not to continue to produce much-needed software for this machine. Publications once dedicated to the advancement of this product now tout Apple, Commodore and IBM products. Retailers whose shelves once overflowed with peripherals and software are now asked "do you have this?" to which they answer "no." The counter-response, "do you know where I can find it?" is now always answered with "I don't know."

How then, can this computer be saved? Only by continued use by its owners and the loyal support of those brave independent companies who will continue to produce products and services for the 99/4A.

Let's face facts. First of all, TI is not going to open its arms and give all of its design secrets to anyone. Why would they want someone else to succeed with a product that failed solely because of their lack of management ability? And secondly, even if someone was to re-engineer the 99/4A or the 99/8 and build them, who would want to take the \$40 million risk to advertise and market them on a national scale? As for additional solid state software products, who do you know that wants to build modules that are now retailing for as low as \$9.95 when they can build new modules with packages for other machines that will fetch \$20-\$30 each?

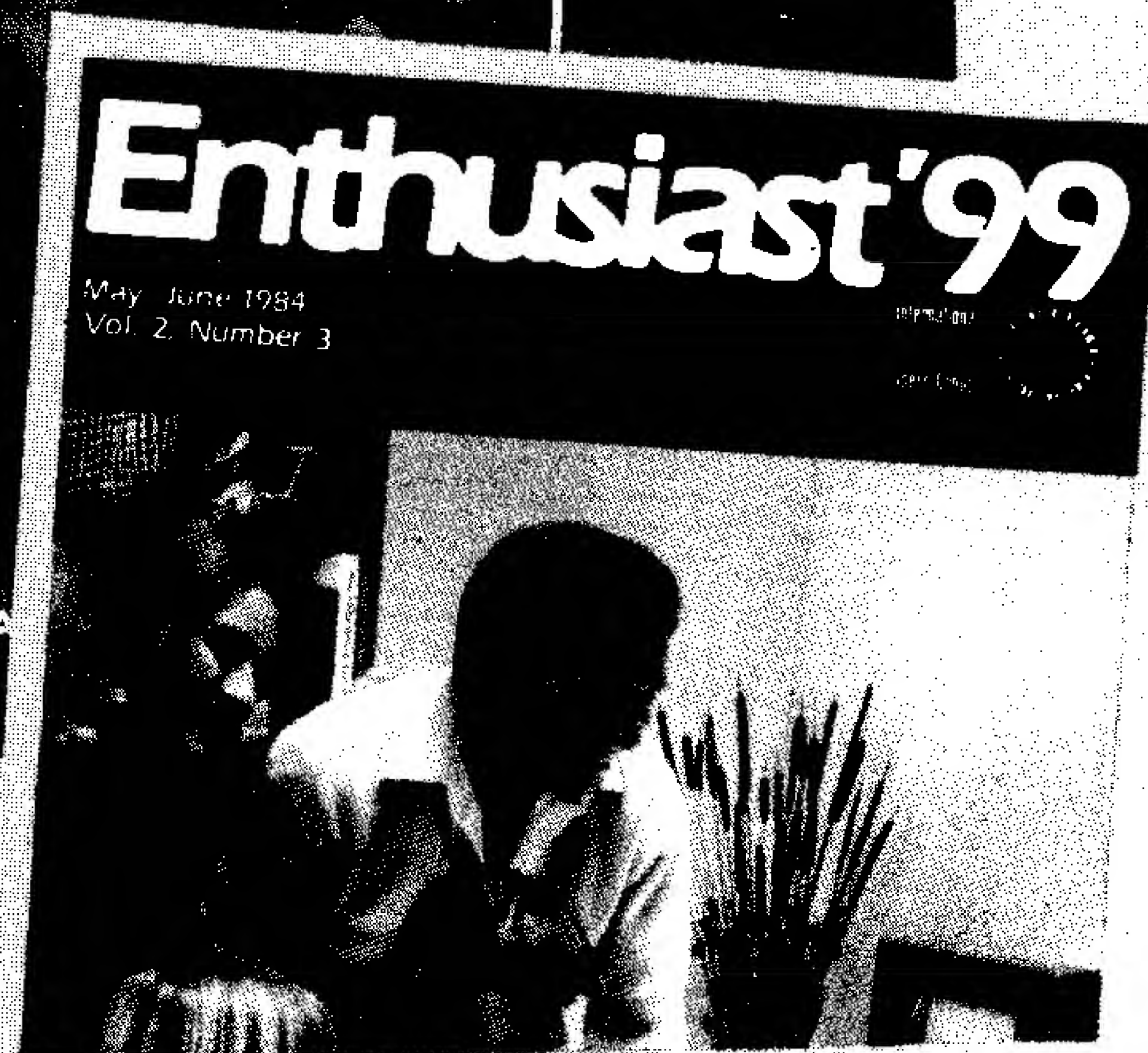
There will be some additional peripheral equipment and there is still about \$30-\$40 million worth of TI software available (some of the better products are already out of stock with little chance of seeing more) from a handful of die-hard dealers and from Triton Sales, TI's new fulfillment house. Yet, TI's computer can survive and find a useful spot in tens of thousands of homes like yours and mine.

These brave new companies I alluded to will continue to service owners of the TI Home Computer for years to come if we will only offer them support. Most of these companies offer good products at reasonable prices but do not have the finances to place full page, four-color advertisements in this or other publications. They are simply independent entrepreneurs trying to make a living from a product which they purchased and in which they believe.

Additional wound-healing will come from local Users Groups and we here at the IUG, but it will take your support to help in this, the recovery process. Get involved with your computer; after all, that's the reason you bought it. Buy a program or two. Try programming or play a game. Not only will you watch it come alive . . . you will help it STAY alive.



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